A LOST DECADE?

SERVICE DELIVERY AND REFORMS IN PAPUA NEW GUINEA 2002-2012

Stephen Howes, Andrew Anton Mako, Anthony Swan,
Grant Walton, Thomas Webster & Colin Wiltshire

THE NATIONAL RESEARCH INSTITUTE

DEVELOPMENT POLICY CENTRE

The PNG Promoting Effective Public Expenditure (PEPE) project, of which this report is a part, aims to better understand how Papua New Guinea allocates its public funds and how these funds are provided to and used by those responsible for delivering basic services.

PEPE is supported by the Australian aid program, through the Economic and Public Sector Program (EPSP). EPSP is managed by Coffey on behalf of the Australian Government.

Supported by

Australian Aid

Published: October 2014

Citation: Howes, S, Mako, AA, Swan, A, Walton, G, Webster, T and Wiltshire, C 2014, *A lost decade? Service delivery and reforms in Papua New Guinea 2002 – 2012*, The National Research Institute and the Development Policy Centre, Canberra.

A LOST DECADE?

SERVICE DELIVERY AND REFORMS IN PAPUA NEW GUINEA 2002-2012

Stephen Howes, Andrew Anton Mako, Anthony Swan,
Grant Walton, Thomas Webster & Colin Wiltshire

October 2014

PNG Promoting Effective Public Expenditure Project

The National Research Institute and Development Policy Centre, ANU

FOREWORD

Papua New Guinea has experienced an unprecedented resource boom over the last decade that has led to a rapid rise in revenue and subsequent increases in public expenditure. The PNG Government and its donors have also implemented major reforms aimed at improving access to basic services across the country. However, the question remains as to whether our nation's booming mineral wealth has translated into services for ordinary people.

In an effort to provide some answers to these important questions, the joint NRI-ANU Promoting Effective Public Expenditure (PEPE) Project completed extensive expenditure tracking and facility surveys across eight provinces at the end of 2012. Survey teams visited 216 primary schools and 142 health clinics from the nation's capital to some of PNG's most remote and isolated communities. Altogether 1,276 interviews were completed, making it one of the largest and most comprehensive service delivery surveys completed in PNG. The PEPE survey was subject to difficulties and logistical problems associated with the large scale of the survey and the need for survey teams to operate in very remote parts of the country. The success of the survey was dependent not only on extensive planning but on the dedication, commitment and effort of the surveyors.

Many of the same schools and health clinics were visited in a similar survey conducted in 2002 that was also undertaken by NRI. By combining findings from both surveys, this report can compare changes in schools and health clinics between 2002 and 2012. The aim is to provide the basic information, which not only the Government of Papua New Guinea but also the people need to assess progress and suggest changes for better spending in the future.

This report and the unique data set on which it is based will be an invaluable resource for PNG's policy makers and people.

Dr Thomas Webster
Director
National Research Institute of Papua New Guinea

ACKNOWLEDGEMENTS

For a project of this size, there are many to thank. First of all, we would like to thank our advisory committee for their insightful guidance and generous encouragement over the last two years: Professor Betty Lovai of the University of Papua New Guinea; and senior representatives of the PNG Institute of National Affairs; the National and Economic Fiscal Commission; the PNG Departments of Education, Health, National Planning and Monitoring, Provincial and Local Government Affairs and Treasury; and the Australian aid program.

We would like to thank the Australian aid program for their support of this research and the Economic and Public Sector Program, and Coffey for housing us and providing us with much needed practical help. We would like to thank all the officials from the National Departments of Education and Health, who gave us invaluable direction and assistance. In particular, we would like to thank the Education Secretary, Dr Michael Tapo, the Health Secretary, Mr Pascoe Kase, and Health Deputy Secretary, Ms Elva Lionel, for their support and collaboration. We would also like to thank all the provincial, district and local level government officials who cooperated with our survey, and shared with us their valuable insights. We thank Tebbutt Research and all our surveyors for collecting the data.

We thank our peer-reviewers: Dr Gaurav Datt of Monash University and Dr Truman Packard of the World Bank. We also thank the many others who provided comments on our drafts, including Jonathan Caseley, Dr Jacques Jeugmans, David Letichevsky, Navy Mulou, Aedan Whyatt, Alex Stephens, and David Towers.

A large number of colleagues at the National Research Institute and The Australian National University have provided support and help along the way. On the NRI side, we would like to thank: Dr Modowa Gumoi, Dr Arnold Kukari, Dr Francis Odhuno, Dr Osborne Sanida, Dr Charles Yala, Lucy Avei, Dennis Badi, Ivan Jemen, Peter Michael Magury, and Ron Sofe. On the ANU side, we thank: Ashlee Betteridge, Kay Dancey, Paul Flanagan, Cleo Fleming, Andrew McNee, Win Nicholas, Jonathan Pryke, Macarena Rojas, Ruth Tay and Nick Wintle (who spent months cleaning and organising the data).

We would like to thank all who have spoken at and participated in our twice-yearly budget fora.

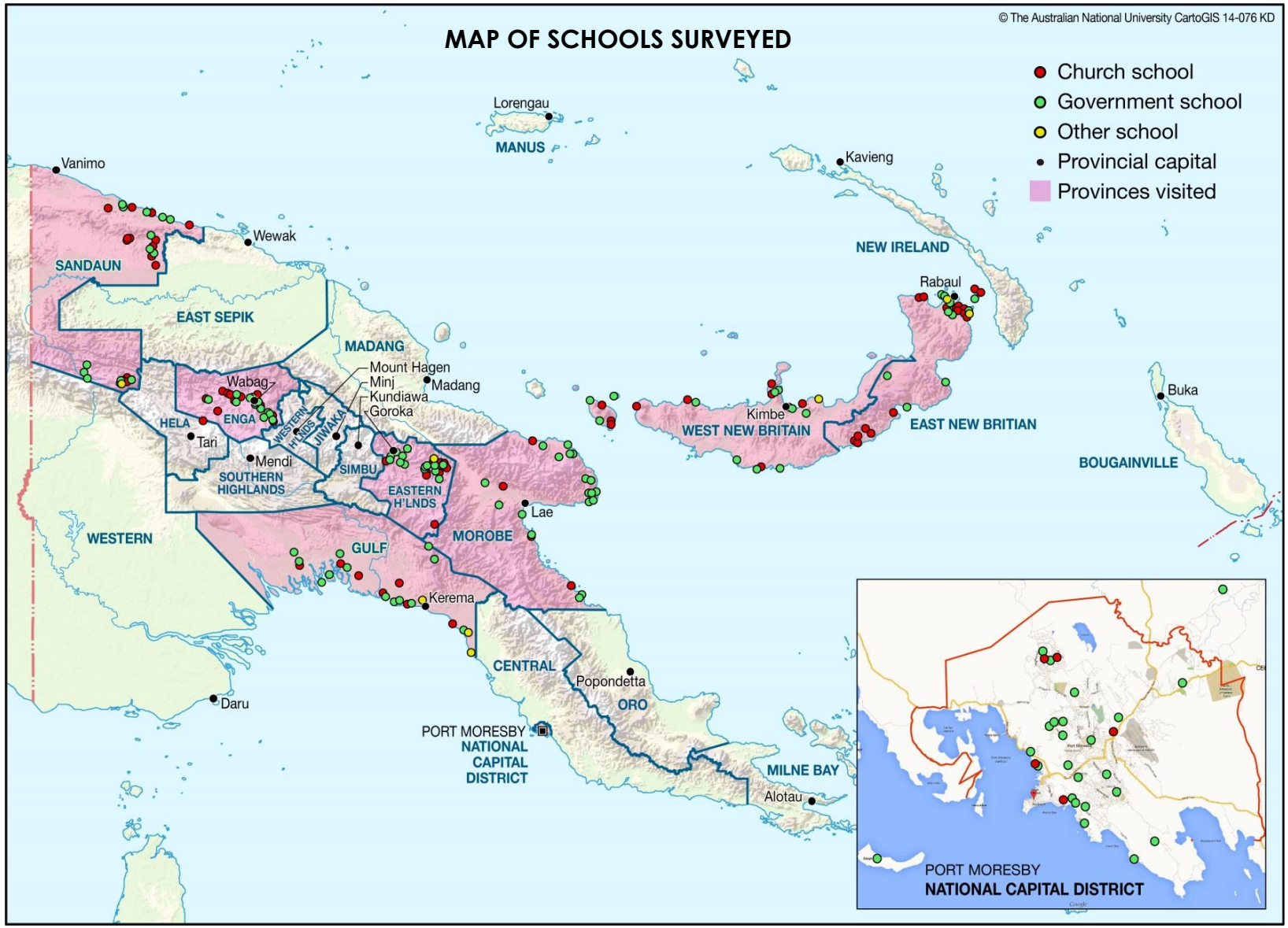
Most of all, we would like to thank the 1,276 individuals who allowed us to interview them in the course of this survey. The information and feedback they provided form the core of this report.

ABOUT THE AUTHORS

Professor **Stephen Howes** is Professor of Economics and Director of the Development Policy Centre, Crawford School of Public Policy, The Australian National University. **Andrew Anton Mako** was a Research Fellow in the Economic Policy Research Program at the National Research Institute for most of the duration of this project. He is currently serving as an Economic Officer with the Pacific Island Forum. Dr **Grant Walton** is a Research Fellow at the Development Policy Centre, Crawford School of Public Policy, The Australian National University. Dr **Anthony Swan** is a Research Fellow at the Development Policy Centre, Crawford School of Public Policy, The Australian National University. Dr **Thomas Webster** is the Director of the National Research Institute. **Colin Wiltshire** is the Project Manager for the PEPE project at the Development Policy Centre, Crawford School of Public Policy, The Australian National University.

The authors take full responsibility for the content of this report. It represents their views, and are not necessarily those of the institutions they represent or who have funded or supported this research, nor of any the individuals mentioned on the previous page.

The PEPE advisory group meets at NRI in Port Moresby, September 2014.



From: CartoGIS, The Australian National University.

Note: Health clinics within a one-hour range of the schools were also surveyed.

SUMMARY

Has PNG been able to translate its economic boom into services for ordinary people?

In 2012, we surveyed 360 primary schools and health care clinics across eight provinces, from the nation's capital to its most inaccessible regions. Many of the same facilities were also surveyed in 2002.

We found that PNG's primary schools have expanded rapidly over the last decade, but that fewer services are now provided by its health clinics.

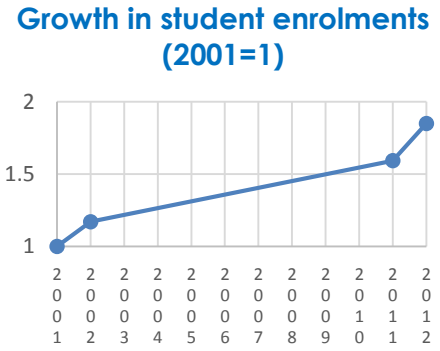
A summary of our key findings and our explanations for them is contained in the text and tables below.

Education

For education, the 2000s was a decade of expansion.

Table 1 summarises a number of indicators for 2002 and 2012. These are based on interviews with Head Teachers, Grade 5 teachers, Board of Management (BoM) Chairs, and P&C or other community representatives at 214 schools in 2002 and 216 in 2012.

For enrolments, we actually have data for 2001, 2002, 2011 and 2012. We can see from this data (shown in the figure opposite) that enrolments in the average primary school have been on the increase throughout the decade, with a cumulative increase of 85 per cent since 2001 and 58 per cent since 2002. (On top of this, the number of schools has increased over the last decade as well.) Note from the figure how the growth in enrolments was turbo-charged by the abolition of tuition fees in 2002 and then again in 2012 (the first abolition was shortlived, as fees were re-introduced in 2003).



The growth in enrolment was much faster among girls. The share of girls among total enrolled students grew from 30 to 46 per cent between 2002 and 2012. By 2012, there were 144 per cent more girls enrolled at the average school than there were in 2002.

Enrolments grew more rapidly than attendance. The proportion of Grade 5 students at school on the day of the survey fell from 84 to 71 per cent between 2002 and 2012. While the rising level of absenteeism is a problem, there are still many more students in school today than ten years ago. The proportion of community representatives saying that most of the children in their community went to school increased from 62 to 70 per cent between 2002 and 2012.

Table 1: PNG primary school performance in 2002 and 2012: a summary

		2002	2012	Growth
Students				
Enrolments	no.	186	294	58%
Share of girls in enrolments	%	30	46	55%
Grade 5 attendance rate	%	84	71	-15%
Grade 5 missed more than 10 days in Term 3	%	9	18	100%
Most children in community attend school	%	62	70	13%
Classrooms				
Number	no.	6.9	8.4	22%
Made of permanent materials	%	63	73	16%
Needing rebuilding	%	32	32	0%
Needing maintenance	%	38	41	8%
With chair & table for teacher	%	44	74	68%
Enrolled students/functioning classroom	no.	38	53	26%
Facilities				
Year-round drinking water	%	58	72	24%
Enough female toilets	%	56	61	8%
Schools with electricity	%	15	27	80%
Infrastructure index		54	60	11%
Teachers				
Positions	no.	7.9	9.6	22%
Working	no.	6.5	8.7	34%
Absenteeism	%	15.1	13.0	-15%
Paid at grade	%	52	89	71%
Paid allowances	%	35	34	-3%
Teacher usually on time	%	69	59	-15%
Teacher usually teaching	%	69	65	-4%
Student/teacher ratio	no.	31	36	14%
Teacher housing				
Number	no.	5.2	6.8	30%
Teacher positions per functioning house	no.	2.5	2.6	12%
Made of permanent materials	%	48	58	21%
Needing rebuilding	%	32	32	0%
Needing maintenance	%	36	39	9%
Textbooks				
Average per subject per grade	no.	29	34	16%
Average students per textbook	no.	2.0	2.2	10%
Enough textbooks	%	24	31	29%
Accessibility				
Time to get to a bank	hrs.	3.9	5.3	36%
Time to acquire mobile reception	hrs.	1.9	0.9	-53%
Remoteness index	hrs.	3.0	3.5	17%
Supervision by Standards Officer (SO)				
At least one SO visit a year	%	56	64	14%
SO checked records	%	56	68	21%
SO submitted report	%	65	80	23%
SO observed classes	%	58	62	7%
Board of Management (BoM)				
BoM meetings	no.	4.0	4.0	0%
BoM membership	no.	8.8	8.0	-9%
BoM effective	%	77	67	-13%
Most say over school subsidy	%	48	67	40%

		2002	2012	Growth
P&C Committee				
Schools with P&C	%	95	96	1%
P&C meetings	no.	3.7	3.9	5%
School revenue				
Total revenue	2012 kina	35,031	87,486	150%
Total revenue per student	2012 kina	159	336	111%

Notes: Functioning classrooms or houses are ones that don't need to be rebuilt. Students per classroom (teacher) are enrolled students per functioning classroom (working teacher). Teacher absenteeism is the number of teachers absent on the day divided by those regularly working. Textbooks refer to Grade 5 and 6 language and maths textbooks. The main informant for these questions was the Head Teacher, but the views on whether teachers are on time and usually teaching, on whether the BoM is effective, and on whether most children in the community attend school are those of the P&C representative (parent in 2002). Grade 5 teachers were asked whether there were enough textbooks, and about Grade 5 attendance and absenteeism. School revenue data from the 2002 survey measures school revenue received in 2001 as 2002 was an exceptional year for funding. 2001 rather than 2002 figures also used where full-year data required (number of BoM and P&C meetings, and whether SO visits) as 2002 survey was mid-year. All figures based on the full samples of 214 schools in 2002 and 216 schools in 2012.

Schools had more teaching positions assigned to them over the decade, and fewer positions were vacant. The average school had 6.5 teachers working in 2002 but 8.7 in 2012, an increase of one-third. Yet, with rapid enrolment growth, the student-teacher ratio rose from 31 to 36.

In 2002, the number of 'ghost' teachers – that is, teachers on the payroll but not at the surveyed school – was in the range of 12-15 per cent. By 2012, this had fallen to zero. Absenteeism among teachers (on the day of the survey) also fell slightly. Community perceptions of teacher punctuality fell and those of the time spent teaching fell slightly.

Schools were also physically bigger by 2012. The average school had 6.9 classrooms in 2002, but 8.4 in 2012. More classrooms were made of permanent materials (73 per cent up from 63), and more had a chair and table for the teacher (74 per cent up from 44). Unfortunately, the number needing rebuilding was unchanged at 32 per cent, while the number requiring maintenance increased slightly from 38 to 41 per cent. The number of enrolled students per functioning classroom (that is, classrooms which do not require rebuilding) increased sharply from 38 to 53.

Teacher housing is critical for PNG's largely rural schools. The average number of houses for teachers per school increased from 5.2 to 6.8. More houses were made of permanent materials, but the same proportion required rebuilding. The number of teacher positions per functioning house increased but only marginally from 2.5 to 2.6.

The quality of other school facilities generally improved, though remained far from satisfactory. The percentage of schools with year-round

drinking water increased from 58 to 72 per cent, and with enough female toilets from 56 to 61 per cent. The proportion of schools with electricity increased from 15 to 27 per cent.

The average number of textbooks per subject per grade went up from 29 to 34. (We looked at Grades 5 and 6 maths and language books.) The average ratio of students to textbook increased slightly from 2.0 to 2.2, though there is a lot of variation from subject to subject and grade to grade. Only 31 per cent of Grade 5 teachers thought that they had enough textbooks, but this was up from 24 per cent in 2002.

Changes in school accessibility were mixed. In 2012, the average school was still one hour away from mobile phone reception, but this was better than the two hours in 2002. The average school was also five hours away from a bank in 2012, up from four in 2002. Overall, on a remoteness index measuring distance from a number of key facilities, the surveyed schools become slightly more remote over the decade.

64 per cent of schools received a visit from the district-level Standards Officer (school inspector) in 2012, up from 56 per cent in 2002. Standards Offficers also seemed to be more active, with more of them submitting reports and checking records.

Nearly all schools have Boards of Management (BoMs). These are statutory bodies (required under legislation) with responsibility for school buildings and teacher houses, student enrolments, school objectives, and discipline. BoMs have been active over the past decade, with eight to nine members, and on average four meetings a year.

School P&C Committees (also required by legislation) also exist at nearly all schools (96 per cent). They are also active, meeting four times a year. 67 per cent of P&C representatives viewed the BoM as effective, down from 77 per cent in 2002.

The improvement in school indicators reflects better funding over the decade. After adjusting for inflation, average school revenue increased by 150 per cent from 2001 to 2012 to reach K87,500, and average school revenue per student increased by 111 per cent to reach K340. Over the decade, national government subsidy payments to schools more than compensated schools for their loss of fee revenue paid by parents.

Subsidy payments are reaching schools, mainly through bank accounts. By the time of our survey, 84 per cent of schools had received both their 2012 subsidy payments. Almost 80 per cent of schools received these payments through their bank accounts.

There is extensive involvement of the BoM in the management of subsidies, but more supervision is required. 67 per cent of Head Teachers regarded

the BoM as having most say over the spending of school subsidy payments in 2012, up from 48 per cent in 2002. But only 39 per cent of schools received a supervisory visit to check on subsidy payments in either 2011 or 2012.

There was enormous provincial variation in the survey. The proportion of communities saying that most of their children went to school rose from 37 to 90 per cent over the decade in East New Britain, but fell from 63 to 37 per cent in Gulf. Less remote schools have better facilities than more remote ones, but not necessarily smaller class sizes.

In summary, PNG's primary schools show more progress than regress over the last decade, but have been struggling to keep up with the surge in enrolments.

Health

The 2002 survey was more focused on education than health. The comparisons we can provide over time for health are limited, but telling. Table 2 summarises survey responses from Officers in Charge at 117 health clinics (aid posts and health centres) in 2002 and 142 clinics in 2012.

Clinics tended to be open for slightly longer every week, but this included a large number which were only open if they had patients to see. The number of patients who visited a health clinic on a typical day fell from 46 to 37, and on the day before the survey from 40 to 28. This is particularly worrying given rapid population growth and since the number of health clinics in PNG has been falling.

The average availability of six basic drugs and supply items fell from 82 to 74 per cent. The number of health worker positions increased from 4.8 to 5.4 per clinic, but the number of health workers who turned up regularly was unchanged at 4.1. The number actually present at the time of the survey fell from 3.4 to 3.2.

We collected a lot more data in 2012 than in 2002 about health clinics. If we look at PNG's primary health care system today we see a system struggling against the odds, and unable to fulfil basic functions.

Table 3 summarises the additional data we obtained about health clinics in 2012 from interviews with the Officer in Charge and a user at each clinic. Our researchers came across many examples of retired health workers continuing to service their community as volunteers. 75 per cent of health workers said they used part of their own salary to meet the needs of the health service.

Clinic rooms, like classrooms, are in a state of disrepair. In 2012, 67 per cent of clinic rooms and 77 per cent of health worker accommodation needed rebuilding or maintenance. Just 41 per cent of clinics had refrigeration, and 40 per cent electricity. Only 20 per cent had beds with mattresses, and only 23 per cent had a kitchen. 55 per cent had year-round water

access. Only 30 per cent had access to fuel, and only 33 per cent could transfer patients.

Oversight is weak in the primary health sector. In 2012, only 40 per cent had a visit from their administrative supervisor, and indeed only 64 per cent said that they had an administrative supervisor.

Community engagement is also low. Only two-thirds of health clinics have a Village Health Committee (similar to the P&C Committee for schools) and in 2012 they only met just over twice a year on average.

The deteriorating performance of PNG's primary health care sector is linked to weak finances. Despite large increases in health function grants to provinces to fund operational costs for health clinics, 41 per cent of clinics reported receiving no external financial support in 2012. Only 25 per cent submitted a budget, and only 18 per cent received funding. 29 per cent relied solely on user fees to cover operating costs. 12 per cent of the clinics we surveyed had no user fees or external support: that is, no means to cover any non-salary costs.

There was significant variation across provinces. In general, East New Britain stood out as a top performer, with the most patrols, and highest maintenance levels and proportion of positions filled.

Table 2: PNG health clinic performance in 2002 and 2012: a summary

		2002	2012	Growth
Days open & patient visits				
No. days open in a week	days	6.2	6.5	5%
Patient visits in a typical day	no.	46	37	-19%
Patient visits the day before	no.	40	28	-29%
Availability of basic drugs & supplies				
Paracetamol	% facilities	81	77	-5%
Fansidar	% facilities	94	95	1%
Chloroquine	% facilities	99	95	-4%
TB	% facilities	52	36	-31%
Condoms	% facilities	95	82	-14%
Liniment	% facilities	72	60	-17%
Average	% facilities	82	74	-10%
Health workers				
Positions	no.	4.8	5.4	11%
Regularly turn-up	no.	4.1	4.1	0%
Present	no.	3.4	3.2	-4%
Supervision				
Visit from a Heath Extension Officer	%	31	34	10%
Visit from a doctor	%	19	11	-42%

Note: Based on responses from the Officer in Charge, and on the full samples for both years of 142 clinics in 2012 and 117 in 2002.

Table 3: PNG health clinic performance in 2012: additional indicators

	Unit	2012
Health workers		
Paid at grade	%	55
Paid allowances	%	30
Use pay to deliver services	%	75
Health workers always or often available	%	70
Number of years in position	years	8.9
Outreach		
No regular health patrols (health centres only)	%	73
Has access to fuel	%	36
Can transfer patients	%	33
State of buildings		
Clinic rooms need rebuilding	%	24
Clinic rooms need maintenance	%	43
Housing needs rebuilding	%	40
Housing needs maintenance	%	37
Maintenance not undertaken in 2012	%	68
Clinic facilities		
Electricity	%	40
Refrigeration	%	41
Year-round water access	%	55
Access to ambulance	%	23
Beds with mattresses	%	20
Kitchen	%	23
Enough toilets	%	51
Village Health Committees		
Clinics with VHC	%	64
No. of meetings	no.	2.2
Supervision		
Has an administrative supervisor	%	64
Has a visit from an admin. supervisor	%	40
Financial support		
Clinics not receiving any external support	%	41
Clinics solely reliant on user fees	%	29
Clinics without external support or user fees	%	12
Clinics receiving user fees	%	83
Clinics submitting a budget	%	25
Clinics receiving funding (cash)	%	18

Notes: Based on responses from OIC, except for 'Health workers always or often available' and the questions about drug supplies which are based on community responses. Other 'Health worker conditions' variables refer to the OIC herself. Health patrols are not regular if there are five or less. All figures based on the full 2012 sample of 142 health clinics.

Explaining the results

PNG's primary schools show substantial and statistically significant improvements across a range of, though by no means all, performance indicators between 2002 and 2012. The decline in the performance indicators for health clinics is not statistically significant, but nevertheless of concern, especially given rapid population growth.[1]

Our research attempted not only to understand differences between education and health and changes over time, but also to explain them. We did this by looking at differences between sectors and provinces and also at differences between facilities, using regression analysis. Our analysis pointed to four important factors influencing performance.

The first is *financing*. There has been a significant increase in education funding over the last decade, and that funding is reaching the schools. As Table 1 shows, even after inflation, revenue per student more than doubled, and total school revenue increased by one and a half times to reach almost K90,000 for the average school in 2012.

The 2002 survey did not collect financial data on health, but, as noted above, the picture that emerges in 2012 is that many health clinics are starved of external support (see Table 3). Because of this, many clinics are simply not undertaking basic functions. For example, 73 per cent of health centres reported not undertaking regular patrols, a basic function. The regression analysis undertaken confirms the importance of revenue for activity levels and, for schools, for infrastructure quality.

Another important determinant of performance is *local oversight* and *supervision*. PNG's schools have well-established local governance arrangements. Nearly all have a functioning BoM and P&C Committee. Health clinics have no equivalent to a BoM, and Village Health Committees are less widespread and active than school P&C Committees. Schools are also more closely supervised by officials than health clinics. The regression analysis shows that schools with closer supervision and better community oversight perform better.

A third factor influencing performance is *agency*. Just over one-third of both schools and clinics in our sample are church-run. In general, church-run clinics receive more funding, and, controlling for other factors, perform more services. The regression analysis shows that teachers at church-run schools spend more time teaching, and that as a result children are more likely to attend church-run schools.

The final performance determinant is the *workforce*. The number of school teachers is

1. See Tables 3-A1 and 4-A1 for statistical tests of differences in means.

growing, but the number of health workers is at best stagnating. Officers in Charge of health clinics are far less mobile than Head Teachers: the former have on average been in position for nine years, the latter only for three. Almost half of PNG's health workers feel that they are not receiving pay consistent with their position. Interestingly, this was also true for Head Teachers in 2002, but the percentage saying they were not being paid at grade fell from 48 to 11 per cent between 2002 and 2012.

A series of case studies will now be undertaken to provide the basis for more detailed policy recommendations. A number do, however, emerge from this analysis.

The primary health care system is in such a dire state that a sequenced approach is needed to its repair: the first priority should be to get the bigger district-level health facilities working.

The governance of health clinics needs to be improved, through a combination of better local oversight and more intensive supervision. Serious consideration should be given to establishing BoMs for health centres, or asking school BoMs to take responsibility for health centres as well. The health workforce needs to be rejuvenated, and its grievances addressed.

The recent decision to abolish health user fees will likely lead to further deterioration of primary health care. User fees were the only resource 29 per cent of clinics had to cover non-staff costs in 2012. If the government wants to improve primary health care, it will have to fund it better. It also needs to ensure that this funding reaches all clinics. Whether this is done by direct funding or by better in-kind support requires further research.

For schools, more attention and resourcing needs to be given to supervision to ensure that all schools are regularly visited. BoMs and P&C Committees should be further empowered.

More attention also needs to be given to lifting attendance relative to enrolment. Our results confirm that quality is key for attendance. For example, more teachers need to be hired to reverse the increase in class sizes.

Given the superior performance of church-run schools and health clinics, existing partnerships with church education and health service providers should be expanded.

Finally, regular monitoring through surveys such as this is invaluable. This survey should be repeated in, say, five years' time.

TABLE OF CONTENTS

Summary v

PART ONE: INTRODUCTION AND METHOD 1

1 Introduction 2
1.1 Introduction 2
1.2 Purpose of the study 3
1.3 Economic and funding context 4
1.4 Education and health in PNG: a brief introduction 5
1.5 Report outline 11

2 Method 12
2.1 Introduction 12
2.2 Survey design and implementation 13
2.3 The education sample 20
2.4 The health sample 21
2.5 Analysis of PEPE survey data 24
2.6 Conclusion 29

PART TWO: A LOST DECADE? 31

3 Primary schools: 2002 to 2012 32
3.1 Introduction 32
3.2 Access to infrastructure and resources 33
3.3 Demand for schooling: enrolments and attendance 35
3.4 Classrooms, textbooks and facilities 38
3.5 Teachers 46
3.6 Formal oversight, community engagement and school management 51
3.7 School funding 57
3.8 Conclusion 60

4 Health clinics: 2002 to 2012 64
4.1 Introduction 64
4.2 Days open and patient visits 65
4.3 The availability and cost of basic medical supplies 67
4.4 Health workers 68
4.5 Health clinic infrastructure and utilities 74
4.6 Health service outreach, mobility and basic service delivery 78
4.7 Patient satisfaction 79
4.8 Supervision and community engagement 80
4.9 Conclusion 83

PART THREE: FINANCING AND REFORMS 87

5 Education financing and the tuition fee-free policy 88
5.1 Introduction 88
5.2 2002 to 2012: From free-to-fee-to-free 90
5.3 How well is the TFF policy being implemented? 92
5.4 Is the TFF policy achieving its objectives? 99
5.5 Conclusion 105

6 Health financing and the free health policy 107
6.1 Introduction 107
6.2 Funding support 107
6.3 In-kind support 111
6.4 User fees 114
6.5 The relative importance of different financing sources 118
6.6 Implications for the free primary health care policy 121
6.7 Conclusion 123

7 DSIP: are health and education benefitting? 128
7.1 MP development funding: an overview 128
7.2 DSIP project allocations 130
7.3 DSIP project implementation and completion 131
7.4 Conclusion 133

PART FOUR: EXPLAINING THE RESULTS 135

8 Facility level explanations of performance 136
8.1 Introduction 136
8.2 Methodology 136
8.3 Performance measures 138
8.4 Explanatory variables 142
8.5 Facility level findings in education 147
8.6 Facility-level findings in health 155
8.7 Overall findings 160

9 Conclusion 163
9.1 Introduction 163
9.2 Finances 164
9.3 Governance 166
9.4 Agency 167
9.5 Workforce issues 169
9.6 Ten key findings 171
9.7 Recommendations 173

Acronyms 177

References 178

FIGURES

Figure 1-1: GDP and GDP per capita, 2012 prices 4
Figure 1-2: Central government expenditure (2012 prices, excluding interest) 5

Figure 3-1: Hours to get to key resources from PEPE and PESD schools 33
Figure 3-2: Hours to get to a bank by province, school agency 34
Figure 3-3: Hours to get to an operating airstrip, by province, school agency 34
Figure 3-4: Hours to get to a trade store, by province, school agency 35
Figure 3-5: Condition of classrooms (%) 39
Figure 3-6: Schools with adequate or good provision of facilities 44
Figure 3-7: Schools with water, toilets and electricity 44
Figure 3-8: Condition of teachers' houses 45
Figure 3-9: Other than the Standards Officer, who else inspects the school (2012, %)? 53
Figure 3-10: Percentage of schools without an inspection from anyone (2012) 53
Figure 3-11: Most say over P&C Committee activities 54
Figure 3-12: The BoM and P&C access and management of finances (%, 2012) 55
Figure 3-13: Percentage of school spending by category 58
Figure 3-14: First preference for spending by respondent (2012) 59
Figure 3-15: First preference for spending by province (2012) 59

Figure 4-1: Average number of days per week health clinic open 65
Figure 4-2: Patient visits to health clinics in a typical day 66
Figure 4-3: Patient visits to health clinics "yesterday" 66
Figure 4-4: Availability of six drugs and medical supplies across clinics 67
Figure 4-5: Drugs and supplies offered free of charge across clinics 68
Figure 4-6: Number of staff attending in-service training (2002 – 2012) 72
Figure 4-7: Percentage of health clinics with no doctor or HEO visit 81

Figure 5-1: Subsidy payments from the central government (2012 prices, million kina) 91
Figure 5-2: Reasons for not receiving a payment (2012) 96
Figure 5-3: Girls' share of enrolment by grade 101
Figure 5-4: Share of classes with more than 45 students 102
Figure 5-5: Average enrolled students per teacher in 2012 102
Figure 5-6: Percentage of P&C respondents who could not afford fees (2012) 104
Figure 5-7: What happens to students unable to pay fees? 104

Figure 6-1: Clinics preparing and submitting budgets; and receiving approval and funding 108
Figure 6-2: Administered support helps clinics to conduct the following activities 114
Figure 6-3: Average cost in kina to collect pay and return to post 123

Figure 7-1: The rise of constituency funding in PNG (Kina million) 128
Figure 7-2: Ratio of constituency funding to total budget spending: a cross-country comparison 129

Figure 9-1: Percentage changes in key indicators: the contrasting fates of PNG's schools and health clinics, 2001/2 to 2012 163
Figure 9-2: Central government funding for health facilities and school operational costs (Kina million, 2012 prices) 165
Figure 9-3: Rebuilding and maintenance requirements in schools and clinics, 2012 165
Figure 9-4: Development spending as a share of total government expenditure - PNG trends and international comparisons 166
Figure 9-5: Pay issues for teachers and health workers 170
Figure 9-6: Share of teachers' salaries in government school spending in PNG 171

TABLES

Table 1-1: Primary schools, students and teachers 9

Table 2-1: Survey milestones 13
Table 2-2: Survey instruments used for health and education sectors 15
Table 2-3: Schools surveyed in 2002 and 2012 20
Table 2-4: Types of schools: government, church, other 21
Table 2-5: Primary school respondents 21
Table 2-6: Health clinics surveyed in 2002 and 2012 22
Table 2-7: Types of health clinics: government, church, other 23
Table 2-8: Health clinic respondents 24
Table 2-9: Share of matching and non-matching schools across PEPE and PESD samples 26
Table 2-10: Share of matching and non-matching health clinics across PEPE and PESD samples 27

Table 3-1: Comparison of average school enrolments 36
Table 3-2: Proportion of Grade 5 students present and long-term absence (%) 37
Table 3-3: Most or all children in the community attend school (%) 38
Table 3-4: Condition of classrooms, disaggregated (%) 40
Table 3-5: Classrooms, and enrolled students per classroom and functioning classroom 41
Table 3-6: Grades 5 and 6 maths and English textbooks per school 42
Table 3-7: Students per textbook, Grade 5 and 6 43
Table 3-8: Teacher positions per functioning house 46
Table 3-9: Positions and working teachers, 2002 and 2012 47
Table 3-10: Ghost teachers 2012 48
Table 3-11: Enrolled students per teacher position and working teacher 48
Table 3-12: Percentage of female Head Teachers and Grade 5 teachers 49
Table 3-13: Experience with school and desire to stay at school 50
Table 3-14: Perceptions about teachers from parents/P&C members (%) 50
Table 3-15: Teacher pay 51
Table 3-16: Percentage of schools with at least one Standards Officer visit; number of visits per year 52
Table 3-17: The BoM and P&C by the numbers 54
Table 3-18: Parents and P&C views on the BoM 55
Table 3-19: Most say on class size and student performance (%) 56
Table 3-20: Most say on human resources (%) 57
Table 3-21: Revenues per school and per student 57
Table 3-22: Revenues per student by source 58

Table 4-1: Health worker numbers at health clinics 68
Table 4-2: Health worker positions and attendance at clinics 69
Table 4-3: User perceptions of availability of health workers at the clinic (%) 70
Table 4-4: Gender composition of the health workforce (%) 71
Table 4-5: Experience at clinic and desire to stay 72
Table 4-6: Health worker pay (%) 73
Table 4-7: Rebuilding and maintenance requirements (%) 75
Table 4-8: Health clinics with electricity, refrigeration and enough toilets 76
Table 4-9: Health clinic water availability (%) 77
Table 4-10: Good and adequate access to an ambulance, beds and kitchen (%) 77
Table 4-11: Health clinic outreach and mobility 78
Table 4-12: User community satisfaction with services provided (%) 80
Table 4-13: The extent of health clinic administrative supervision 82
Table 4-14: Village Health Committees and community interaction 83

Table 5-1: Tuition fees under the TFF and Tuition Subsidy policy (kina per child) 89
Table 5-2: Revenues per student 2011 and 2012 in 2012 prices 93
Table 5-3: Type of payment for subsidy, 2011 and 2012 (%) 94

Table 5-4: Cost and time of accessing subsidy payments in 2012 95
Table 5-5: Receiving subsidy payments in 2011 and 2012 96
Table 5-6: Supervision of subsidy payments 98
Table 5-7: Most say over spending school subsidies (%) 99
Table 5-8: Average enrolments per school 100
Table 5-9: Growth in enrolments by grade (%): 2011-2012 100
Table 5-10: Official school costs (in Kina per child, constant 2012 prices) 103

Table 6-1: Clinics preparing and submitting budgets; and receiving approval and funding (%) 109
Table 6-2: Funding received from budget submissions 110
Table 6-3: Clinics receiving supplies or materials from funding providers 111
Table 6-4: Clinics receiving support for activities and programs (%) 112
Table 6-5: Service charges for common treatments – children and adults 115
Table 6-6: Charges for common drugs and supplies at health clinics 115
Table 6-7: Average annual user fees raised at health clinics 116
Table 6-8: OIC and user views on fees, affordability and exemptions 117
Table 6-9: What happens if you don't pay user fees? Community and OIC views 118
Table 6-10: Extent of support received from funding, in-kind and fees (%) 119
Table 6-11: Average support received from funding, in-kind and fees 119
Table 6-12: Percentage of health clinics that normally meet expenses for conducting key health services through 120
Table 6-13: Estimates of user fees (Kina) raised across health clinics 121
Table 6-14: Health clinics with operational bank accounts (%) 122

Table 7-1: DSIP project prevalence and value: provincial and agency breakdowns 131
Table 7-2: Perceptions of DSIP fairness and application process (%) 131
Table 7-3: DSIP implementation modalities (%) 132
Table 7-4: DSIP completion rates and implementation delays 132

Table 8-1: Summary statistics of dependent variables for school regressions 139
Table 8-2: Summary statistics of dependent variables for health clinic regressions 141
Table 8-3: Summary statistics of explanatory variables for school regressions 144
Table 8-4: Summary statistics of explanatory variables for health clinic regressions 146
Table 8-5: Regression results for school infrastructure regressions (in levels) 147
Table 8-6: Additional regression results for school infrastructure regressions 148
Table 8-7: Regression results for school infrastructure (in first-differences) 149
Table 8-8: Results for school resources regressions (in levels) 151
Table 8-9: Results for school management regressions (in levels) 152
Table 8-10: Results for school management regressions (in first-differences) 153
Table 8-11: Results for school output regressions (in levels) 154
Table 8-12: Results for school output regressions (in first-differences) 155
Table 8-13: Results for health clinic infrastructure regressions 156
Table 8-14: Results for health clinic resources regressions 157
Table 8-15: Results for health clinic management regressions 159
Table 8-16: Results for health clinic output regressions 160

Table 9-1: Some comparisons between church and government schools and health clinics 169

Table 2-A1: A comparison of means across matching and non-matching samples (primary schools) 29
Table 2-A2: A comparison of means across matching and full samples (primary schools) 30
Table 2-A3: A comparison of means across matching and non-matching samples (health clinics) 30
Table 3-A1: Summary statistics and tests of difference for education variables, 2002 and 2012 62

Table 4-A1: Summary statistics and tests of difference for health variables, 2002 and 2012 85
Table 6-A1: Budget submissions and funding received by funding provider 127
Table 6-A2: Health clinics that received direct funding without preparing a budget 127
Table 6-A3: Percentage of clinics assisted with administered support to carry out various activities in 2012 127

PART ONE:
INTRODUCTION AND METHOD

1 INTRODUCTION

1.1 Introduction

The state of Papua New Guinea, supported by a host of non-state actors, has long sought to ensure that its citizens are healthy and well educated. While there has been some success, there is still much to do: many Papua New Guineans are illiterate and suffer from poor health. Turning this around requires a variety of resources and reforms. Teachers and health workers need to be trained, paid and, in many cases, housed. Health clinics and schools need to be built and maintained; they need to be stocked with medicine and equipment or teaching materials. Funding must be available. Both spending and staff need to be regularly monitored. Improving health and education outcomes in PNG – ensuring that students learn and patients are treated – requires responding to these complex and sometimes competing challenges with limited resources and within a difficult environment.

PNG's National Departments of Education and Health play a central role in policy development. Provincial and local level governments are mainly responsible for implementing these policies under decentralised service delivery arrangements. Their efforts have been augmented by support from churches, NGOs, international donors, and increasingly MPs, who use their constituency funds to build classrooms or new health facilities.

Both education and health funding have been greatly increased over the last decade. And a number of reforms have been implemented to improve service delivery. What has been the result? Little monitoring has taken place. There is a paucity of information about the success or otherwise of policy reforms, and about how the education and health systems have fared over the past decade. Have health clinics and schools improved over the past ten years or, as many suspect, have they deteriorated? Are more resources available for Head Teachers and Officers in Charge of health clinics, or less?

This report tries to answer these questions. It presents the results of a survey of health clinics and schools across eight provinces, from the nation's capital to its most far-flung and inaccessible regions. Many of the same schools and health facilities were surveyed at the start of the decade, in 2002. The report compares funding, financial management, governance arrangements and quality indicators for schools and health clinics between 2002 and 2012. It also analyses the impacts of key policy reforms.

The report provides the basic information that is needed by not only national departments and provincial governments, but indeed the people of PNG, to assess progress and suggest changes.

This chapter provides the objectives of the project, an overview of the current policy context in PNG, an introduction to the health and education sectors, and an outline of the report.

1.2 Purpose of the study

The Promoting Effective Public Expenditure (PEPE) project is a joint research initiative between PNG's National Research Institute (NRI) and the Development Policy Centre at The Australian National University. The overall purpose of the research is to analyse how PNG allocates its public money through the national budget, and to better understand the effectiveness of this expenditure in key service delivery sectors. The project arose out of a concern that the country faces major challenges in converting resource revenues from the recent boom in mineral wealth into effective development outcomes. To support more effective allocations and better expenditure practices, the project conducted a public expenditure and facility survey focusing on schools and health facilities across PNG in 2012. This report presents the main findings of this research.

The PEPE survey had two major objectives. The first was to replicate key aspects of the Public Expenditure and Service Delivery (PESD) survey undertaken by NRI and the World Bank in 2002. In 2012 we visited most of the schools and health clinics that NRI and the World Bank did in 2002. PESD survey instruments were used as a basis for designing the PEPE surveys. This enabled us to study progress and regress between 2002 and 2012. While many facility surveys have been undertaken around the world, it is rare to have two comparable surveys. The combination of the two enables us to provide not just a snapshot but a dynamic assessment.

The second objective was to understand the financing arrangements of the health and education sectors, and to analyse the impact of recent financing reforms. This report focuses on three areas in particular:

- **Education financing and the Tuition Fee-Free policy.** In 2012, school tuition fees (up to Grade 10) were abolished and, in compensation, subsidies were paid directly as a grant to schools (via individual school bank accounts) by the national government. While there has been much conjecture about the effectiveness of this reform, there is little empirical evidence to support claims of success or otherwise.
- **Health financing and the free health policy.** Health function grants paid to provinces to support primary health care functions were introduced in 2004 and have been increased significantly since. But little is known about how much of this funding is actually received at the health facility level. In 2013, the government abolished health user charges as part of its free health policy. This happened after our survey, but the survey

provides useful information on how important user fees were, and how hard or easy it will be to replace them.

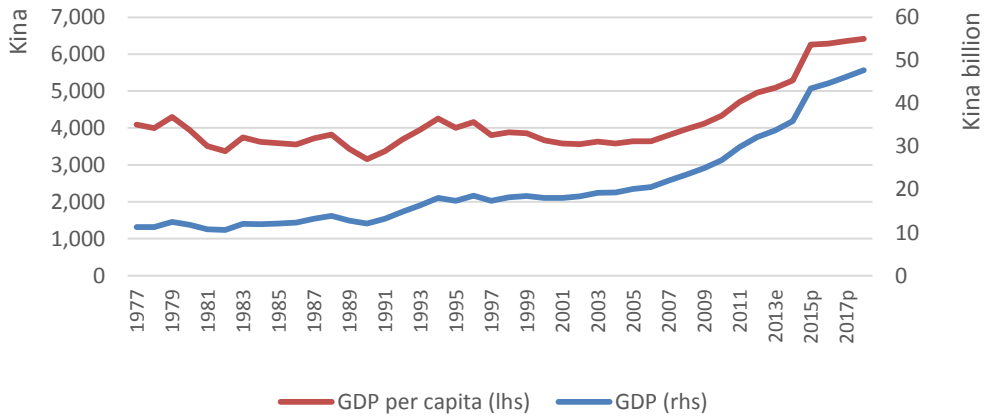
- **MP funding.** Constituency funding, through the District Service Improvement Program (DSIP), has become an important source of revenue for the health and education sectors. Given the recent massive increases in DSIP funding, it is timely to examine its importance and effectiveness for health clinics and schools in our sample.

In sum, this report provides a stocktake of progress over the last decade, and an analysis of financing reforms.

1.3 Economic and funding context

Success in the health and education sectors is tied to the broader economy and to the government's revenue position. PNG has experienced uninterrupted and rapid economic growth for more than a decade. As Figure 1-1 shows, this reversed the declining trend in income per capita apparent since the early 1990s, and income per capita is today at record levels. Economic growth is forecast to continue to remain reasonably strong in coming years, with a big boost in 2015 from the PNG LNG project.

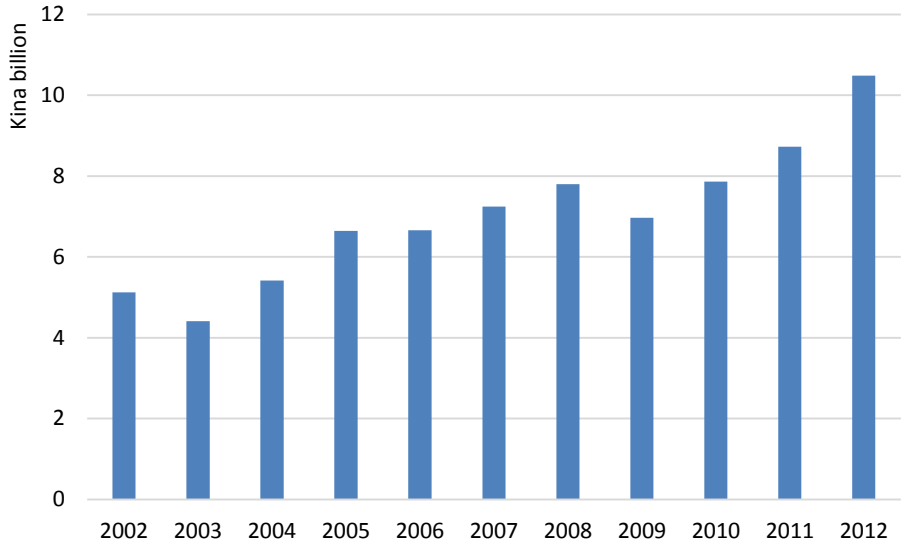
Figure 1-1: GDP and GDP per capita, 2012 prices



Notes and sources: Bank of PNG and national budgets. GDP deflator provided in budget documents used from 1994 onwards; CPI deflator before that. 'e' is an estimate, and 'p' are projections.

With rapid economic growth has come an expansion of government revenue and spending. As Figure 1-2 shows, over the ten-year period that is the focus of this report (2002 to 2012), government spending approximately doubled after inflation, from K5.1 billion to K10.5 billion. (This is in 2012 prices, and excluding interest, since interest payments are not available for service delivery.)

Figure 1-2: Central government expenditure (2012 prices, excluding interest)



Notes and sources: National budget documents. The GDP deflator given in the budget is used to deflate the series.

It is difficult to work out how much expenditure has gone to primary schools and health clinics over this period, but there has certainly been a large increase. For example, operational funding to all schools has increased from K56 million in 2004 to K735 million in 2013 (in 2012 prices). Operational funding to health facilities is estimated to have increased from K18 to K93 million over the same period, also adjusting for inflation (see Figure 9-1). Has PNG been successful in translating this increased funding into improved services? Or has it been a lost decade? These are critical questions for this report.

1.4 Education and health in PNG: a brief introduction

There is a lack of recent reliable data on social indicators in PNG. The 2011 census should help fill some of the gaps, but its results have not yet been released, and there are questions about its reliability. Available estimates suggest slow improvements off a low base. Average life expectancy in PNG is estimated to have increased from 60 in 2002 to 62 in 2012 (World Bank 2014). In the 2009-10 Household Income and Expenditure Survey (HIES), 30 per cent of respondents reported themselves to be unwell, and 18 per cent said that they had been suffering from malaria in the month before the survey (NSO 2013). Adult literacy is estimated to have increased from 57 per cent of the population in 2000 to 63 per cent in 2012 (World Bank 2014). In 2009-10, 51 per cent of women and 40 per cent of men reported primary as their highest attained educational level (NSO 2013).

There is an urgent need to improve PNG's social indicators. Papua New Guineans are estimated to live six years less than people in Solomon Islands, and 20 years less than Australians (World Bank 2014). While the official literacy rate is estimated to be 63 per cent, tests of literacy carried out independently estimate literacy rates to be much lower; in

some provinces they may be as low as 15 per cent (ASPBAE, 2011). The country is unlikely to achieve any of its Millennium Development Goals by 2015.

Given the poor outcomes to date, there is concern that economic growth will do little to significantly improve the lives of Papua New Guineans. Increasing government allocations to health and education is important, but clearly not enough. We need to check if funds are being translated into services, and services into outcomes.

The 2009-10 HIES has some useful information on usage of the health and education systems (NSO 2013). The gross primary enrolment rate is 74 per cent at the primary school level, but there are many over-age children at school and there are many children not at school at all. 48 per cent of children (girls and boys) aged 6 to 11 years and 19 per cent of children aged 12 to 14 years (21 per cent girls) have never been to school. The HIES also tells us that the population is heavily reliant on the health system. 15 per cent (16 per cent in rural areas) reported visiting a health clinic in the last month.

There is a scarcity of independent data on the state of PNG's health and education system. Of course, the Departments of Health and Education collect administrative data but this is not independent and is often not public nor comprehensive. There have been studies of funds flowing to the provinces and districts for service delivery (NEFC 2012 and World Bank et al. 2013), but not down to the facility level. The PESD survey of 2002 resulted in two useful reports on PNG's schools, the main focus of that survey (World Bank & National Research Institute 2004 and Guy et al. 2003). This study aims to update these reports and extend their coverage to health clinics, and thereby help fill the knowledge gap.

Since independence, PNG has witnessed significant changes to the management and financial arrangements of its health and education systems. Both have been affected by the devolution of powers from the national to subnational governments after independence. In 1977 the Somare government passed the Organic Law on Provincial Government (OLPG) that empowered subnational governments to provide and administer services. Further decentralisation came in 1995 with the enactment of the Organic Law on Provincial Governments and Local Level Governments (OLPGLLG), often referred to as the most significant political and administrative change since independence. The 2013 District Authority Act is an amendment to the OLPGLLG. It promises to further decentralise administrative functions to the district level. The way these and other policies have shaped PNG's education and health systems to the present day is explored below.

PNG's education system

The colonial government and the churches ran PNG's schools until the early 1970s, when a national education system was established. At

independence the new nation inherited a centralised colonial bureaucracy. The government was quick to decentralise political power. The two decentralization acts, the 1977 OLPG and the 1995 OLPGLLG, established an administrative division of labour: the national government became responsible for the implementation of national education policy; the provinces became responsible for service delivery and planning.

The National Department of Education (NDoE) is today primarily responsible for developing, implementing and coordinating national plans and policies. It also supports the provinces with planning, professional services, developing and monitoring standards, distributing school subsidies, managing pre-service training for teachers, and managing teacher payrolls. Provincial and local level governments are responsible for developing and operating schools. The Teaching Service Commission (TSC) employs teachers, sets salaries and conditions of employment, approves teacher appointments, and handles industrial relations (World Bank et al. 2007). Salaries are paid directly by the central government to teachers. Most infrastructure development is carried out at the provincial level by a sub-committee of the Provincial Education Board (PEB), which is comprised of the Provincial Education Manager, who chairs the PEB, and other stakeholders, including churches and technical officials (NDoE 2009).

The education sector is funded by a variety of sources. The biggest funder is the central government, which pays teacher salaries and sends national subsidy payments direct to schools. These payments are in lieu of tuition fees, which have been reduced over time, and largely abolished in 2012 (see Chapter 5). The central government also funds teacher training and Standards Officers (district-level school inspectors). As well, it provides education function grants to provinces to distribute basic learning materials to schools and fund district education office operations and supervision. Some provinces also contribute from their own revenue. Though tuition fees have been largely abolished, schools still raise project fees (and some may continue to charge tuition fees). Funding and in-kind support is also provided by non-governmental organisations, donors, churches and others. Funds are also available through constituency funds controlled by MPs.

Churches play a crucial role in providing education across PNG. They run a significant proportion of the education sector, from elementary schools through to universities. Just over half of primary schools in the country are run by churches. The NDoE works closely with the Churches Education Council, with the latter engaging with the government on education policy and implementation. Administratively, the majority of church-administered schools are fully integrated into the government system. The government provides teachers to church-run schools, and pays their salaries. Church schools also receive

subsidy payments. Church bodies provide supervision of their schools, and some provide additional funding.

Schools in PNG have developed governance structures. The Head Teacher plays a pivotal role in schools: managing teachers, students, infrastructure and finances. According to section 62 of the PNG Education Act (as amended in 1995), the school's Board of Management (BoM) is responsible for school planning and management, ensuring availability of school buildings and teachers houses, student enrolment, determining school aims/goals, disciplining and suspending students, and other duties as identified by the BoM itself. The nature of activities depends on funding available. According to section 61 of the Act, the BoM must consist of at least five members of the community, a teacher and the Head Teacher. Also according to the Act, Parents and Citizens (P&C) Committees are to augment the BoM by representing the views of parents and the broader community.[2] The PESD survey found that in 2002 almost all of the 214 schools they visited had both a BoM and a P&C Committee (World Bank & NRI 2004). Under the government's Tuition Fee-Free policy (see Chapter 5) the Head Teacher and BoM are jointly responsible for managing school subsidies; the P&C Committee provides oversight and approves funding decisions.

The structure of the education system was significantly altered by the education reforms of 1993. They redefined schooling to consist of three years of elementary and six years of primary (this was defined as 'basic education') and four years of secondary education. Community schools were whittled down to comprise of grades Preparatory to 2, rather than 1 to 6 as under the previous system. Primary schools – the focus of this report – were introduced to incorporate grades 3 to 8. Secondary schools were introduced for grades 9 to 12, replacing high schools (grades 7 to 10) and national high schools (grades 11 and 12). The reforms were designed to increase access, equity and retention at all levels of education. They are widely perceived to have helped increase enrolments (World Bank et al. 2007, p. 133), but some think that quality suffered as a result.

A second part of these reforms focused on curriculum reform to emphasise local language and vocational skills. Introduced in 2003, this system is known as Outcomes Based Education (OBE). It gives a greater role to teachers in determining what students learn, and requires that children in elementary (Prep to Grade 2) are taught in the local language rather than English. As a result, many children struggled to make the transition from elementary school to primary school as the latter is taught in English. After criticism about the effectiveness of OBE (see Agigo 2010 for a critical evaluation), Prime Minister O'Neill announced in 2011 that the system would be scrapped. However, a government taskforce asked to evaluate the OBE

2. The Act refers to P&C Associations, but they are more commonly called P&C Committees.

argued that the system should be retained, although it recommended an extensive overhaul of the education system, including increasing English and Mathematics teaching at elementary and primary schools. The taskforce's 48 recommendations were approved by Cabinet in August 2013, with the NDoE tasked with implementation (Islands Business 2013). Despite this, recent comments from Minister for Education Nick Kuman suggest that OBE will be completely phased out by 2015 (Kiala 2014).

According to official statistics, more than 915,000 primary school students were enrolled across the country in 2012 (Table 1-1). There were more than 24,000 teachers, giving a student-teacher ratio of 37. The number of primary schools has increased over the past decade, from 3,300 primary schools in 2003 to 3,595 in 2012 (NDoE 2012b).

Table 1-1: Primary schools, students and teachers

	2012
Number of schools	3,595
% government schools	47
% church and other schools	53
Students enrolled	915,970
Teachers	24,706
Students per teacher	37.1

Source: NDoE communication.

PNG's health system[3]

In the early 1970s the soon-to-be independent nation of PNG developed its first National Health Plan (1974-78). The 1977 OLPG attempted to decentralise responsibilities for health services, but failed to specify responsibilities between the levels of government, leading to haphazard implementation (Regan 1991). The 1995 OLPGLLG attempted to clarify the responsibilities of provincial and local level governments to provide primary health services, but national funding allocations were grossly insufficient to fund these functional responsibilities (NEFC 2005). In addition, not enough was done to oversee and monitor health spending to the facility level (Thomason & Kase 2007).

Today, the PNG National Department of Health (NDoH) is responsible for the planning and coordination of the health system. NDoH is also responsible for funding hospitals around the country, including the national referral hospital, a specialist psychiatric hospital, four regional hospitals and provincial public hospitals. Most health clinics are the responsibility of provincial and local-level governments, working closely with various church agencies. Provincial administrations run government health clinics and manage health workers who are paid centrally. Church-run clinics are integral to the health system and provide almost half the ambulatory services. Churches are more autonomous than government-run institutions,

3. This section draws on WHO and NDoH (2012) and World Bank (2012).

but they are also highly subsidised, with more than 80 per cent of their service costs financed by the government. Church-run health clinics are governed by church health service providers (Catholic and Lutheran for example) that manage the clinics and employ the staff. There are also a small number of other health operators, including for-profit organisations but also NGOs, community groups and traditional healers.

In 2009 there were 21 provincial hospitals augmented by 14 district and rural hospitals that provide basic health services, including medical, surgical, obstetric, paediatric, trauma and 24-hour emergency care. There were also 192 health centres, 73 urban clinics and 447 sub-health centres. This group of facilities manages chronic and acute conditions, can provide basic surgical and paediatric care, and performs deliveries.

The bulk of patient care is handled by aid posts. In 2009, it was estimated that almost 2,000 aid posts were open, but this figure is not known with accuracy, and an increasing number of aid posts are believed to be closed. Aid posts are staffed by community health workers (often a single worker) and deliver basic health care, including mother and child care and community-based health promotion. With aid posts playing a critical role in determining the accessibility of the health system, the increasing proportion of closed facilities is concerning.

Over 12,000 people worked in the public health sector in 2009, most as community health workers. The World Bank (2012) reports that while the numbers of administrative staff doubled between 2004 and 2009, the number of health extension officers, nurses, allied health professionals and community health workers declined.

PNG's health system is in the midst of changes to governance and financial arrangements. Provincial Health Authorities (PHAs) have been established in some provinces. PHAs are being formed to manage primary and secondary care under a single model in each province. Under this system, the PHAs report directly to the Governor of the province and Minister for Health, rather than the Provincial Assembly, as the rest of the provincial administration does for other sectors. It is uncertain whether PHAs will survive the proposed establishment of District Development Authorities.

The health sector receives funding from a variety of sources. The central government is by far the biggest financier. It pays the salaries of government health workers, and provides grants to both provinces and church health service providers. Church health service providers pay the salaries of health workers, and also provide church-run clinics with operational funds or support. To help overcome underfunding of basic health requirements, health function grants to provinces were introduced in 2004 and subsequently expanded to fund operational costs at the facility level. Provinces with less internal revenue receive

more grant funding than wealthier provinces, which are expected to contribute their own funding to the health budget. In principle, all health facilities can access these funds, but in practice getting funds to the facility level can be a challenge.

Apart from the central government, MPs provide project funding through their DISP allocations. Various donors, NGOs, churches and others make in-kind and cash contributions. Until recently, user fees have been charged, but in 2014 the government officially abolished them (except for hospitals where fees have been subsidised) under its free primary health care and subsidised specialist services policy.

As Cairns (2014) highlights, the relationship between various levels of government are fluid and often dependent upon personal relationships. There are also some areas of health delivery where the roles and responsibilities of those meant to deliver services are less than clear. For example, there have been questions over who is responsible for water supply and emergency patient transfers (Cairns 2014).

At the health facility level, the Officer in Charge (OIC) plays a key management role, but the role varies depending on facility type. At aid posts, the OIC is often the only health worker available and is therefore responsible for all aspects of service delivery. OICs at aid posts report to larger health centres, which are responsible for overseeing aid posts. OICs at these health centres normally manage all aspects of operations, including staff and patients.

Community involvement in managing health clinics is, by and large, limited. Some clinics have Village Health Committees (VHCs), made up of local representatives to promote community engagement.

1.5 Report outline

This report is divided into three parts. The first comprises the introduction (this chapter), and the methodology for both the PESD (2002) and PEPE (2012) studies (Chapter 2).

The second part compares findings between 2002 and 2012 to consider whether the health and education sectors have experienced a 'lost decade'. Chapter 3 looks at the changes in education while Chapter 4 does the same for health.

The third part of the report focuses on sector financing and financing reforms. In Chapter 5, education financing is reviewed in light of the Government's Tuition-Fee Free education policy. Chapter 6 examines health financing and the free health policy. Chapter 7 examines funding from Members of Parliament through constituency funds.

The fourth and final part of the report tries to explain the results. Chapter 8 takes the analysis down to the facility level. A number of regressions are run to understand why some facilities perform better than others. Chapter 9 brings this analysis together with our sectoral and provincial comparisons to conclude.

2 METHOD

2.1 Introduction

The NRI-ANU Promoting Effective Public Expenditure (PEPE) project conducted an expenditure tracking and facility survey in late 2012 to assess progress in service delivery over the last decade and the effectiveness of recent expenditure reforms. 48 surveyors in eight survey teams travelled to 216 schools and 142 health clinics to conduct face-to-face interviews with teachers, health workers and community members. Surveys were conducted across eight provinces, two from each region of PNG, including some very rural and remote locations. Public officials responsible for administering funding and monitoring education and health sectors at the district and provincial levels were also surveyed. In all, there were 11 quantitative survey instruments and 1,276 interviews, making the survey one of the largest and most comprehensive completed in PNG.

The main objective of the survey was to collect nationally representative data on basic service-delivery facilities, their condition and ability to provide services, the outputs they produce, and their financing and governance. Data collection on education and health outcomes, such as measures of the cognitive ability of students or the health status of community members, was beyond the scope of the survey. Of course, these are critical, but so too are inputs and outputs. Without basic data on how many children are going to school, how many health workers are turning up to work, and what the condition of school buildings and health clinics is, it will not be possible to monitor progress in PNG's health and education sectors. These are data that every country needs.

The survey was designed to enable comparison of survey results with the Public Expenditure and Service Delivery (PESD) survey completed ten years earlier by NRI and the World Bank. While many tracking surveys have been carried out worldwide, few have been repeated. Carrying out the same survey twice greatly enhances the value of the exercise, as it enables the research not just to take a snapshot but to measure progress (or its absence). Especially in a country like PNG, where natural variability is so high, going back to the same schools and health facilities is critical for comparability. The 2002 PESD survey was conducted prior to the resource boom in PNG. It thereby provides a baseline to measure the impact of subsequent government expenditure on schools and health facilities.

This chapter begins by providing an outline of the research instruments and sampling framework used in the survey, including an overview of how the survey was conducted in challenging conditions. The basic characteristics of the education and health data collected are then presented, followed by the approach taken to data analysis.

2.2 Survey design and implementation

The complete process from the design of the 2012 PEPE survey to the completion of this report has been a journey of over two years. Table 2-1 provides a simplified timeline. A consultative process has been followed and the project has included a survey design workshop, and sharing of survey results at twice-yearly budget fora to seek feedback on findings from policymakers and other stakeholders. After the initial analysis, project researchers also revisited the provinces that were in the survey and met with provincial government representatives to share preliminary findings and verify results.

Table 2-1: Survey milestones

Survey milestones	Date completed
Survey design workshop	July 2012
Recruitment of survey team	August 2012
Pilot survey (Central Province)	September 2012
Survey team training	October 2012
Survey fieldwork	November – December 2012
Post fieldwork cleaning workshop	December 2012
Data input	January – March 2013
Data cleaning	March – May 2013
Preliminary survey analysis	June – August 2013
Re-visiting surveyed provinces	August 2013
Presentation of preliminary findings	September 2013
Further analysis and production of PEPE report	Up to October 2014

The sub-sections that follow explain how we went about the process of survey design, sample selection and data collection.

Survey design

The 2012 survey design built on the 2002 survey to ensure direct comparisons could be made across the 10-year period. But it also made significant modifications to reflect major changes in PNG's expenditure policies and other reforms over the last decade. A key lesson from expenditure tracking surveys worldwide is that data should be collected to inform the policy debate (Filmer 2008, Sundet 2008). The literature suggests that designing surveys to track specific expenditure items of importance to policymakers is not only more manageable but often produces better policy recommendations (Gurkan et al. 2009). The PEPE surveys simplified the PESD surveys in some regards but also modified them to collect data relevant to recent major health and education reforms and initiatives: health and education financing, including the abolition of fees; medical supplies and text book distribution; and the use of constituency funding.

The first public consultation about the research project focused on survey design. The survey workshop was held in Port Moresby with more than 50 participants, including from PNG Government agencies,

the University of PNG, NGOs and other development agencies. Many of these participants had an intimate understanding of PNG's financial and service delivery systems, so were able to make useful recommendations for survey questions.

A pilot phase for testing surveys with research supervisors from ANU and NRI proved critical in developing effective survey instruments. The pilot phase consisted of approximately two weeks of fieldwork in two districts of Central Province covering close to ten schools and health clinics. Ensuring participants from the pilot phase gave detailed feedback at the end of the survey was given considerable emphasis during testing. The feedback received pointed to areas of improvement in relation to the approach, sequencing of questions and terminology used.

Survey participants and instruments

The 2002 survey was mainly focused on education services, and had only one survey instrument on health clinics (compared to six on education). The 2012 survey took a more balanced approach, with five survey instruments on health and six on education (Table 2-2).

The surveys focused on interviewing a range of key participants at the facility, district and provincial level. Responses were recorded using paper-based survey questionnaires administered by trained surveyors. Four groups of participants were selected for interviews, and 11 participant types in all.

The most detailed interviews were with those in positions of authority in administering public funds for the provision of basic services. For schools, separate sets of questions were prepared for the Head Teacher and the Chair of the school's Board of Management (BoM). For health clinics, we prepared questions for the Officer in Charge (OIC) at the health facility.

Second, key service providers were also selected for interview. We sought to interview a Grade 5 teacher at every school, and a health worker at every clinic that had more than one worker.

Third, to capture the perspective of the community and of service users, we prepared questions for one representative from each school's Parents and Citizens (P&C) Committee and one user from each health clinic.

Fourth, and finally, to investigate supervisory arrangements, we interviewed the provincial Health and Education Managers (sometimes called Advisors). At the district level, we also interviewed District Health Managers, as well as District Standards Officers. The latter are national-government (rather than provincial-government) staff, and are responsible for the oversight and inspection of schools.

As well as soliciting the views of all of these stakeholders, the surveys also collected data on important facility characteristics, such as school

enrolments and patient visits. Other topics included textbook and drug availability, the amount, timing and sources of funding and spending practices, as well as community interaction and government oversight.

Table 2-2: Survey instruments used for health and education sectors

Education surveys	Health surveys
Head Teacher*	Officer in Charge of health clinic*
Grade 5 teacher*	Another health worker at the clinic
School Board of Management Chair*	
Parents and Citizens Committee member*	User of the clinic from the community
District Standards Officer	District Health Manager
Provincial Education Manager*	Provincial Health Manager

Notes: * PESD survey conducted with the same category of respondents in 2002. The 2002 PESD also interviewed the District Education Manager (a provincial employee), whereas we interviewed the District Standards Officer (a national government employee).

Sampling framework

The PEPE survey used the same sampling method as the PESD survey, attempting to re-visit as many of the same primary schools and health facilities as possible for direct comparability.

The 2002 PESD survey purposively selected two provinces from each of PNG's four regions,[4] namely:

- Southern region (Gulf, National Capital District (NCD));
- Highlands region (Enga, Eastern Highlands);
- Momase region (Sandaun, Morobe); and
- Islands region (West New Britain, East New Britain).

Within each province, three districts (with the probability of selection proportional to the number of schools in each district) were randomly selected, except for cases where provinces only had two districts.[5] The selected districts were: Kerema and Kikori in Gulf; Lagaip–Porgera, Wabag and Wapenamanda in Enga; Kainantu, Obura-Wonenara and Unggai-Bena in Eastern Highlands; Aitape-Lumi, Nuku and Telefomin in Sandaun; Finschafen, Huon and Tewae-Siassi in Morobe; Kandrian-Gloucester and Talasea in West New Britain; Gazelle, Kokopo and Pomio in East New Britain. Ten primary schools were selected from each district based on simple random selection.[6] There are no districts

4. One more developed and one less developed province was chosen from each region (World Bank and NRI 2004, Annex 1).
5. In fact, 'open electorates' were sampled. These are the constituencies from which PNG's 'open' MPs are elected (that is MPs other than provincial governors). In PNG, 'open electorates' and 'districts' are often used interchangeably, and we follow that practice. In some cases, however, one open electorate might contain more than one district.
6. Prior to the 1993 reforms, PNG had 'community' rather than 'primary' schools. In 2003, about half of the schools surveyed were still community schools. By 2012, 90 per cent of the schools surveyed were primary schools. For simplicity, we refer to all community schools as primary schools as well.

in the National Capital District, but there are three electorates (see footnote 5), and 30 schools were randomly sampled from NCD. The sample of health clinics was determined by selecting the closest health facility to each school up to a travel time of half an hour. In this way, the PESD survey sampled 214 schools (close to the target of 220) and 117 health clinics.

The 2012 PEPE survey selected exactly the same provinces and districts. Wherever possible, the same schools and health clinics were surveyed as well. To increase the number of health clinics, the allowed travel time to a health clinic from each school was increased to one hour. When schools selected under PESD were closed or inaccessible, they were replaced using simple random selection within the electorate in question. Also, when less than ten schools had been surveyed under PESD, additional schools were randomly selected to increase the sample size. There was one PESD district that was not accessible due to tribal fighting (Kandep in Enga). In this case, another district in the same province was selected.

In all, the PEPE survey visited 216 schools, including 167 of those surveyed in 2002, and 142 health facilities, including 63 of those surveyed in 2002. The distribution of all schools visited by researchers in 2012 is shown in the map at the start of this report.

Selecting and training surveyors

Recruitment of skilled and experienced surveyors for a large survey required careful consideration. There were a total of eight survey teams covering each province, including four to eight surveyors per team, sourced through an experienced private survey firm (Tebbutt Research) operational in PNG. Each team had a team leader and an experienced NRI/ANU supervisor, who provided technical support and travelled to fieldwork sites. Surveyors (team members) were Papua New Guineans selected to ensure that they were either from the region where they were conducting the survey or at least had significant experience of that region or province. Particular attention was also paid to promoting gender balance amongst survey teams. This approach ensured survey teams were well informed and experienced in dealing with cultural sensitivities relevant to local contexts for conducting the surveys.

Research supervisors from NRI and ANU were selected based on their previous experience conducting fieldwork and implementing surveys in PNG. Extensive consultation was carried out with researchers and surveyors involved in the PESD survey in 2002.

Training survey team leaders to understand the intentions behind the survey and how to administer the instruments in the field was important to successful implementation. Particular emphasis was placed on outlining the theory and purpose of each survey. Survey instruments were explained in considerable detail to ensure that complex questions would be interpreted consistently. A series of

prompts and instructions were inserted into many survey questions to act as reminders and provide guidance.

NRI/ANU supervisors and each of the surveyors were provided with a detailed survey manual. This included a comprehensive overview of all survey instruments, including the theory and reasoning behind both sets of health and education surveys, and the importance of a consistent approach to fieldwork across provinces.

Conducting fieldwork across PNG

Consent was gained from the PNG government through each of its layers of bureaucracy down to the school and health facility level. This included the national departments of health and education and the various provincial governments involved in the survey. It was particularly important for facility-level managers to understand that this independent research was carried out with government consent. Survey teams gained oral consent from participants prior to conducting survey interviews. In addition, information sheets written in Tok Pisin were given to participants, which, if not understood by the participant, were explained in their local language by a surveyor from the province.

Conducting survey fieldwork in a country as diverse as PNG with many remote locations presented major challenges. Survey teams travelled to locations with few communication and transport options, including very limited access to financial services. This required survey teams to be well organised and aware of safety concerns. Significant planning prior to undertaking fieldwork proved critical to monitoring progress and completing surveys in a timely manner and to a high standard. Identifying potential risks to carrying out a survey of this scale and scope in PNG was necessary before survey teams conducted fieldwork. Travelling to remote locations meant small planes and boats needed to be hired and survey teams had to walk long distances on foot. In addition, some areas of PNG are prone to violence.

Successfully carrying out the survey in the field required careful monitoring and support from the NRI and the survey firm's head offices in Port Moresby. Weekly progress reports from survey teams on the number of facilities completed, including verification from NRI/ANU supervisors, helped ensure steady progress. Combining NRI/ANU supervisors with staff from the survey firm in each province proved to be an effective and reliable way of carrying out the survey. While NRI/ANU supervisors focused on overseeing survey implementation and relationships with provincial and district officials, team-leaders and surveyors were able to focus on conducting the survey at schools and health facilities.

Survey teams learnt a lot by visiting schools and health facilities. In this report, we focus on the numbers, and use tables and graphs. But the stories that the team members brought back with them are no less

useful, and their photos often more vivid. Two examples of what we learnt follow below: from Gulf and from Enga.

The PEPE survey in Enga – Andrew A. Mako

30 primary schools and 19 health facilities were surveyed over two months in three districts of Enga province, one of two Highlands provinces covered by the PEPE survey. Enga is mostly rural and remote, with mountainous terrain, high rainfall and poor infrastructure.

Most of the schools and health facilities we surveyed were quite isolated and far from major towns. It took hours of walking to reach them after driving on roads and crossing bridges that had severely deteriorated due to lack of maintenance. For facilities in remote parts of Enga, access to funds, including school subsidies, is difficult. Facilities have to overcome many obstacles to source materials for schools and medicines.

The level and frequency of contact or support from the district, provincial, and national government is variable. Facilities in remote parts of the province had minimal to no visits and support in many years, including compulsory school and health inspections.

Neglect of the maintenance of existing infrastructure is a major challenge for effective service delivery, including those facilities that are close to the provincial capital. Classrooms and teacher and health worker houses with leaking roofs, no desks, walls with huge holes, and broken windows and doors were common in many facilities that we visited.

The survey team met some very dedicated teachers and health workers, including retired ones, such as the individuals shown here, who volunteer to work under very trying conditions to ensure that facilities stay open. Most of these people take on extra responsibilities, such as teaching multi-grade classes.

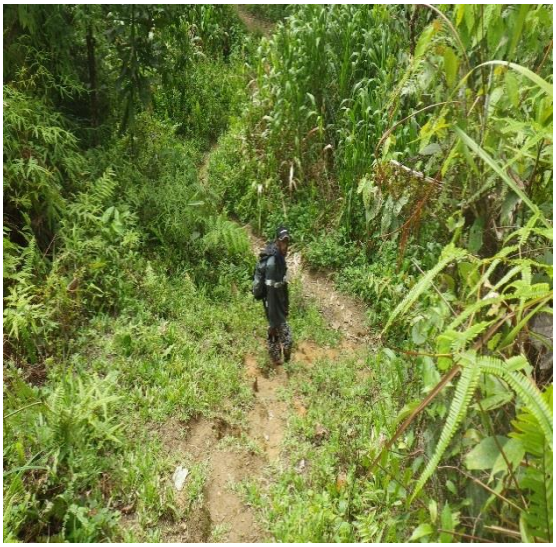
Service delivery and development in Enga face many challenges, but seeing dedicated teachers and health workers, paid and unpaid, continue to provide services to their communities in the most difficult conditions was inspirational.

The PEPE survey in Gulf – Colin Wiltshire

Service delivery in Gulf Province requires a 'never say die' attitude. The PEPE Gulf survey team experienced first-hand the difficulties that government and church service providers face when operating in one of PNG's most rural, remote and underdeveloped provinces.

Travelling to Kikori District, the largest of the two districts that make up Gulf Province, is very difficult when the airstrip is not operational. The only option is to hire a dinghy with an outboard motor to travel in the open sea. This takes a day and more than 100 litres of fuel, making the trip expensive, exhausting and often dangerous.

The number of schools closed since the previous survey was carried out ten years earlier was striking. On a trip to West Kikori, close to the border of Western Province, the lack of schools and health facilities to serve more remote populations was clear. In one case, provincial and district officials assured us certain schools and health clinics were operational, but when we visited we found that they had been closed for years.



Upon approaching another school in our dark blue land cruiser, which looked a lot like a police vehicle, a group of people rushed to a dinghy on the shore and set off on the sea. At the same time, disgruntled parents ran to the car yelling that the Head Teacher and BoM Chair were escaping and demanded that the team chase them down and arrest them as they had supposedly been misusing the school's funding.

We encountered a decaying service delivery system in Gulf Province that is unable to ensure a teacher will be present to teach classes each weekday or that a health worker will have an operational clinic, drugs or lighting to treat a medical emergency at night. In place of a robust and well-regulated system were individuals determined to ensure basic services persisted despite all the problems. There were inspiring examples of retired and retrenched teachers and health workers that continue to help communities when no other services are provided.

2.3 The education sample

214 schools were visited in 2002 and 216 in 2012 (Table 2-3). The number of schools visited per province was also similar with one exception: in 2012, we visited six more schools in Gulf.[7] In both surveys there were a higher number of government schools than church schools.

There are 167 matching schools, visited in both 2002 and 2012. Over the ten years some schools had changed from church to government schools. Schools were classified by their degree of remoteness (explained below). In 2002, there were more schools where key resources were readily accessible and fewer that were very remote compared to 2012.

Table 2-3: Schools surveyed in 2002 and 2012

	Number of schools		Matching schools		Year established	
	2002	**2012**	**2002**	**2012**	**2002**	**2012**
Overall	214	216	167	167	1974	1973
East New Britain	30	29	29	29	1969	1964
West New Britain	16	16	11	11	1975	1976
Morobe	30	28	23	23	1973	1974
Sandaun	30	29	24	24	1981	1979
Eastern Highlands	29	29	23	23	1974	1972
Enga	30	30	14	14	1975	1971
Gulf	19	25	14	14	1975	1976
NCD	30	30	29	29	1967	1970
Government	115	126	90	98	1976	1975
Church	91	83	72	66	1971	1970
Readily accessible	63	56	60	49	1966	1966
Accessible	64	77	52	60	1976	1972
Remote	38	25	24	18	1978	1974
Very remote	27	56	16	39	1980	1980

There were slightly fewer church-run schools in the 2012 sample, and more government schools (Table 2-4). While still a very small percentage, in 2012 slightly more schools considered themselves neither a church nor a government school. This small 'other' category included private schools. In both surveys NCD had the highest proportion of government schools; church schools were most prevalent in East New Britain, Enga and Sandaun.

7. This was because in 2002 the Kikori district of Gulf was undersampled.

Table 2-4: Types of schools: government, church, other

	Government (%)		Church (%)		Other (%)	
	2002	2012	2002	2012	2002	2012
Overall	55	58	44	38	1	3
East New Britain	40	34	57	59	3	7
West New Britain	53	50	47	44	0	6
Morobe	54	75	46	25	0	0
Sandaun	37	48	63	48	0	3
Eastern Highlands	76	62	17	34	7	3
Enga	41	50	59	50	0	0
Gulf	61	60	39	32	0	8
NCD	80	83	20	17	0	0
Readily accessible	70	68	29	32	2	0
Accessible	52	57	45	38	3	5
Remote	39	60	61	40	0	0
Very remote	59	48	41	46	0	5

In each school we visited, the Head Teacher or Acting Head Teacher was interviewed. In nearly every school, we also interviewed the BoM Chair, a P&C Committee member and a Grade 5 teacher (Table 2-5). All were surveyed in 2002, except that the PESD surveyed a parent at each school rather than a P&C representative.

Table 2-5: Primary school respondents

	Head Teacher		BoM		P&C rep./ parent		Grade 5 teacher	
	2002	2012	2002	2012	2002	2012	2002	2012
Overall	214	216	202	203	213	215	179	205
East New Britain	30	29	30	30	30	30	26	30
West New Britain	16	16	14	16	16	16	14	16
Morobe	30	28	28	28	29	28	24	27
Sandaun	30	29	30	29	30	30	24	30
Eastern Highlands	29	29	27	26	29	29	27	25
Enga	30	30	29	30	30	30	22	30
Gulf	19	25	18	20	19	26	12	19
NCD	30	30	26	24	30	26	30	28

2.4 The health sample

As Table 2-6 shows, the 2012 PEPE survey surveyed 142 health clinics, up from 117 in 2002, due to the decision to widen the "search range" for health clinics relative to schools (from half an hour to one hour). Only 63 of the 117 clinics surveyed in 2002 could be re-surveyed. This indicates how many health clinics have closed in PNG in the intervening decade.

Table 2-6: Health clinics surveyed in 2002 and 2012

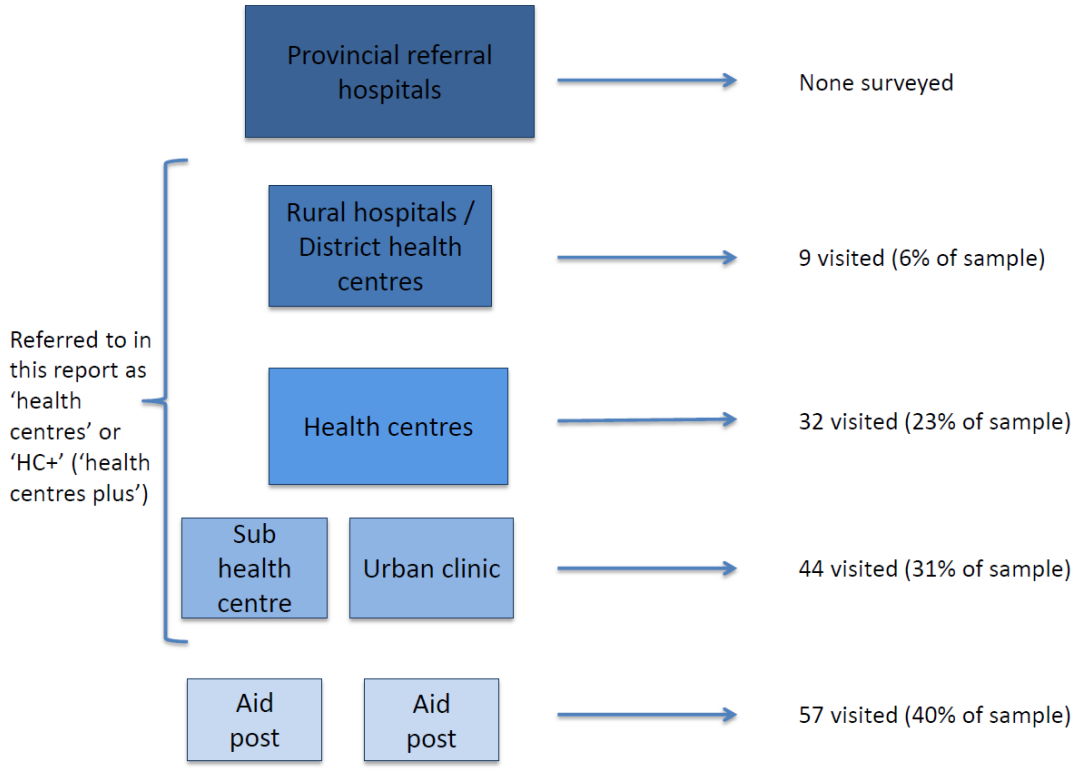
	2002	2012	Matching facilities (both)
Overall	117	142	63
East New Britain	8	21	6
West New Britain	11	14	8
Morobe	25	20	11
Sandaun	22	18	11
Eastern Highlands	9	11	7
Enga	13	19	2
Gulf	14	23	8
NCD	15	16	10
Health centres	59	85	40
Aid posts	58	57	23
Government	78	85	38
Church	35	52	23

Notes: Matching health facilities visited in Enga Province were particularly low due to tribal fighting.

PEPE survey teams visited the complete range of health facilities that make up PNG's primary health network (Chapter 1.4). Aid posts are usually the first point of contact for patients, since they are normally located in the rural and remote settings where the majority of PNG's population lives. Figure 2-1 shows that aid posts accounted for 40 per cent of the health clinics visited by survey teams. Aid posts are normally managed by a single Community Health Worker (CHW) and can only offer basic treatment. They normally refer patients requiring more comprehensive care to a health centre or sub health centre, which are often responsible for managing clusters of aid posts within a defined population of villages or towns, also known as catchment areas. A further 31 per cent of health clinics surveyed were sub-health centres or urban clinics in more heavily populated areas, and 23 percent were classified as health centres. Rural hospitals, also known as district health centres (normally located in district town centres), represented 6 per cent of the health clinics visited.

In presenting findings for this report, because they normally have only a single health worker, aid posts have been separated from the various types of health centres. 'Health centre plus' represents 60 per cent of the facilities or clinics (sub-health centres, urban clinics, health centres and rural hospitals) surveyed and aid posts represent the other 40 per cent. No provincial referral hospitals were surveyed because they represent secondary-level care in PNG's health system and operate somewhat separately from the primary health system.

Figure 2-1: Types of health clinics surveyed (and 2012 percentage)



Slightly more government than church-run health clinics were surveyed. As Table 2-7 shows, in 2012, 60 per cent were government-run, 37 per cent were church-run and only 2 per cent were "other", mainly privately-run. A higher proportion of aid posts were government-run than health centres. Contrary to the case of education, a greater proportion of church-run clinics were surveyed in 2012 than 2002.

Table 2-7: Types of health clinics: government, church, other

	Government (%)		Church (%)		Other (%)	
	2002	2012	2002	2012	2002	2012
Overall	66	60	28	37	5	3
East New Britain	50	62	50	38	0	0
West New Britain	64	64	27	36	9	0
Morobe	72	50	28	40	0	10
Sandaun	73	67	23	33	4	0
Eastern Highlands	67	55	22	27	11	18
Enga	77	68	15	32	8	0
Gulf	36	39	64	61	0	0
NCD	80	81	20	13	0	6
Health centres	51	56	42	42	7	1
Aid posts	83	65	14	28	3	7

Three separate interviews were conducted at each clinic with the OIC of the clinic, another health worker at the same clinic (if employed and available), and a community user of the clinic (Table 2-8).

Table 2-8: Health clinic respondents

	OIC		Health worker	User
	2002	2012	2012	2012
Overall	117	142	82	142
East New Britain	8	21	11	21
West New Britain	11	14	6	14
Morobe	24	20	6	20
Sandaun	22	18	10	18
Eastern Highlands	9	11	8	11
Enga	13	19	11	19
Gulf	14	23	14	23
NCD	15	16	16	16
Health centre	59	85	71	85
Aid post	58	57	11	57
Government	78	85	50	85
Church	35	52	31	52

Note: Health workers and users were not surveyed in 2002. Many health clinics, especially aid posts, do not have a health worker in addition to the OIC.

2.5 Analysis of PEPE survey data

Organising the data

The process of data entry, coding and cleaning of the PEPE data was time consuming due to the length and number of variables contained in the questionnaires. Data entry was performed by the survey firm. The data was entered using SPSS software, which in many cases ensured that entered data conformed to the appropriate format for each variable.

Coding of the data and data cleaning was performed using SAS software. The benefit of this approach is that any changes to the original data set are non-destructive, that is, all changes to the original data are documented and can be identified and modified at any time.

Data weighting

Weighting of the PEPE data was necessary since roughly equal numbers of schools and health clinics were sampled in each surveyed district, but some districts had many more schools and clinics than others. District-specific weights were applied to each facility type based on a population of schools provided by NDoE and a population of health clinics provided by the Australian Department of Foreign Affairs and Trade (previously AusAID). These weights adjust for the probability of the district being selected within the province, and of the facility

being selected within the district. Separate weights were applied to health centres and aid posts.

The actual weights applied to the data were variable specific; for each variable the district-specific weights were adjusted by a factor that accounted for missing observations for that variable to ensure representativeness. For example, if one out of 10 schools sampled in a district was missing an observation for a variable then the weights for the other nine schools in that district would increase by a factor of 1.11 for that variable. A strength of this approach is that missing observations do not impact on the relative contribution of each district to the overall sample. However, as there are few facilities per district sampling variability can influence the weights.

Similar weights had earlier been developed to make the PESD school sample representative, and these were used but with the same modification to adjust them for missing variables.[8] Weights were never developed for the PESD health data, and the 2012 health weights were also used for the 2002 data.

With these weights, the survey results are representative of the eight provinces which were sampled. Given that one more and one less developed province was selected from each of the four regions, it is reasonable to argue that these eight provinces are representative of the nation of PNG, and that therefore the survey is nationally representative.

The results presented in the rest of the report are weighted, unless otherwise stated.

Remoteness index

We developed a remoteness index for both 2002 and 2012 schools to identify how close schools are to key resources. To develop this index we drew upon questions (asked in 2002 and 2012) to head teachers about how far the school was in hours from the nearest bank, health clinic, trade store, provincial capital and police station. To be included in the index schools needed to have answered how far they were from each of these resources (that is, there were no missing values). Remoteness was categorised by the following rules:

- Schools that were, on average, within a half an hour of these resources were categorised as ‘readily accessible’;
- Schools that were, on average, over half an hour but less than two hours away were categorised as ‘accessible’;
- Schools that were over two hours but less than four hours away were categorised as ‘remote’;

8. When figures for 2002 in this report differ from that those in the PESD, it may be due to this difference in weighting. In some cases, different assumptions (e.g. number of working hours in the day) may be used to define the variable. We obtained the PESD data from the World Bank website.

- Schools that were over four hours away were categorised as 'very remote'.

The remoteness index is used when presenting findings for schools. Remoteness for health facilities is largely dependent on facility type. Aid posts are generally located in rural village settings. They are normally more remote than health centres, which are often based in towns, such as district and LLG centres.

Sample comparisons

The substantial diversity across Papua New Guinea creates challenges in making comparisons of schools and health facilities over time. To address this problem the PEPE survey was designed as a longitudinal study; the PEPE sample included as many schools and health clinics as possible that were surveyed in the PESD survey. In this way comparisons over time would be made, as far as possible, on a like-for-like basis.

However, a number of facilities were not open at the time of the PEPE survey or could not be reached by survey teams due to dangerous conditions or deteriorated infrastructure. Table 2-9 shows the proportion of schools that were sampled in both surveys out of the total number of schools surveyed in each year (matching sample) and the share that were non-matching in each sample. A comparison of matching and non-matching health clinics in each survey is shown in Table 2-10.

Table 2-9: Share of matching and non-matching schools across PEPE and PESD samples

	2001/2002		2012	
	Matching (%)	Non-matching (%)	Matching (%)	Non-matching (%)
Overall	78	22	77	23
East New Britain	97	3	100	0
West New Britain	69	31	69	31
Morobe	77	23	82	18
Sandaun	80	20	83	17
Eastern Highlands	79	21	79	21
Enga	47	53	47	53
Gulf	74	26	56	44
NCD	97	3	97	3
Government	78	22	78	22
Church	79	21	80	20
Readily accessible	95	5	88	13
Accessible	81	19	78	22
Remote	63	37	72	28
Very remote	59	41	70	30

Table 2-10: Share of matching and non-matching health clinics across PEPE and PESD samples

	2002		2012	
	Matching (%)	Non-matching (%)	Matching (%)	Non-matching (%)
Overall	54	46	44	56
East New Britain	75	25	29	71
West New Britain	73	27	57	43
Morobe	44	56	55	45
Sandaun	50	50	61	39
Eastern Highlands	78	22	64	36
Enga	15	85	11	89
Gulf	57	43	35	65
NCD	67	33	63	38
Health centres	68	32	47	53
Aid posts	40	60	40	60
Government	49	51	45	55
Church	66	34	44	56

22 per cent of schools in the PESD survey were not resampled in the PEPE survey and 23 per cent of schools in the PEPE sample were not contained in the PESD sample. Schools in remote areas, were more likely to fall in the non-matching sample, because remote schools are harder to revisit, and perhaps are more likely to close. It is important to note that not all non-matching schools are subject to this problem. One entire district had to be replaced, and the PEPE survey increased the sample of schools from Gulf, a very remote area. Random replacement within selected districts goes some way to addressing this problem. Nevertheless, it is still possible that the replacement schools on average are less likely to be as remote as the schools in the PESD sample they replaced. This non-random nature of sample attrition can potentially lead to biased comparisons over time when they are based on the full sample of schools from each survey.

To test whether the sample comparisons were subject to this problem, the means of a number of important variables in the matching sample were compared to the means in the non-matching sample. For schools this comparison was done for all provinces other than East New Britain and NCD since the share of matching schools in these two provinces was so high. Annex Table 2-A1 shows that the difference in means across the matching and non-matching sample in the PESD survey, but note the PEPE survey, for remoteness and school size related variables (remoteness itself, as well as student enrolment, number of teacher positions, and number of teachers regularly working) were statistically different from zero. Essentially, more remote and smaller schools in the PESD survey dropped out of the PEPE survey and were replaced by average schools.

The effect of sample attrition may then upwards bias comparisons of indicators related to remoteness and school size over the decade when

they are based on the full sample (matching and non-matching) of schools. Comparisons based on just the matching sample are not subject to this specific problem since only like-for-like comparisons are made. In order to see if the sample attrition problem significantly affected the full sample results, the means of important school variables based on the full sample and the matching sample of schools were compared. Annex Table 2-A2 shows that results based on the matching or full sample were not statistically different from each other across all variables analysed.

For this reason, and since using the full sample will give us a larger sample size, and because only using matching schools will result in its own biases, all comparisons of school indicators over the decade were based on the full sample schools. Essentially, while results based on the full sample are subject to attrition bias, the effects can be considered small.

Compared to schools, the attrition rate for health clinics was high. The matching sample of health clinics represented only 54 and 44 per cent of the full sample for the PESD and PEPE surveys, respectively. Similar to schools, the mean of a number of health clinic measures were compared across matching and non-matching samples for each survey in order to identify potential problems associated with sample attrition. However, as shown in Annex Table 2-A3, the differences in these means were not statistically different to zero for all variables. This result provides no evidence of sample attrition bias for health facilities and all comparisons were based on the full sample of health clinics in both PESD and PEPE surveys.

Another potential source of bias is that the PEPE sample is likely to have under-represented new facilities. This effect is somewhat diminished through the selection of replacement facilities for those dropping out of the PESD survey, which opens up the potential for new facilities to be included in the PEPE survey. Nonetheless, this potential bias is likely to be small, as the rate of increase of schools is slow, and of health clinics negative.

In summary, both sources of bias – undersampling of new schools, and attrition bias – are modest and a small price to pay for the possibility of making reliable comparisons in a country as diverse as PNG. All comparisons in the report are based on the full PESD and PEPE samples of schools and clinics, respectively.

The PESD team visited schools and health facilities around the middle of 2002. The 2012 PEPE visits were late in the year. For questions about how many times something happened over a year – for example, how many times schools were inspected – we draw on responses comparing 2001 with 2011 or 2012. Unfortunately, 2001 data is not available for health clinics.

2.6 Conclusion

The PEPE survey data constitutes an important evidence base for evaluating the state of and changes in front-line service delivery in PNG. The representative nature of the sample enables the data to provide a general view of education and health service delivery across the whole country. Since the PEPE survey builds on the PESD survey, it also allows 10-year comparisons on the state of service delivery. The analysis can therefore examine not just the levels of health and education service delivery indicators, but also the change in these indicators over time.

The two surveys combined provide us with clear and detailed information on the current and changing state of infrastructure, staffing, school enrolments, number of health treatments, funding and spending at the facilities, community engagement, and formal oversight. All of these are explored in detail in the following chapters.

In PNG, there is a need for health and education officials, as well as the general public, to have information on the performance of current and previous efforts to improve schools and health facilities in the country. The design, conduct and analysis of the PEPE survey have been undertaken to meet these requirements.

Chapter 2 Annex

Table 2-A1: A comparison of means across matching and non-matching samples (primary schools)

	PEPE			PESD		
	Matching	Non-matching	Difference	Matching	Non-matching	Difference
Remoteness index (hours)	3.6	3.7	-0.1	2.2	4.5	-2.2
	(0.4)	(0.6)	(0.8)	(0.3)	(0.9)	(0.9)*
Revenue per student	383.2	308.5	74.7	151.3	126.9	24.4
	(87)	(74)	(114)	(13)	(24)	(28)
Enrolment	305.5	310.1	-4.6	202.1	132	70.1
	(25)	(31)	(39)	(19)	(16)	(25)*
Teacher positions	9.4	9.3	0.1	8.2	6.4	1.8
	(0.6)	(0.9)	(1.0)	(0.5)	(0.6)	(0.8)*
Working teachers	8.5	8	0.5	6.9	3.5	3.4
	(0.6)	(0.8)	(1.0)	(0.5)	(0.4)	(0.7)*
Share of permanent classrooms	0.7	0.7	0.0	0.6	0.5	0.1
	(0.0)	(0.1)	(0.1)	(0.0)	(0.1)	(0.1)

Notes: Unweighted means for all schools in the PEPE and PESD surveys except those in East New Britain and NCD. Standard errors in parentheses. * indicates that the difference in means across the matching and non-matching sample is significantly different.

Table 2-A2: A comparison of means across matching and full samples (primary schools)

	PESD					PEPE				
	Matching		Full		Difference	Matching		Full		Difference
	N	Mean	N	Mean	Mean	N	Mean	N	Mean	Mean
Remoteness index (hours)	152	1.9	192	2.5	-0.5	166	3.3	214	3.3	-0.1
		(0.3)		(0.3)	(0.4)		(0.6)		(0.5)	(0.8)
Total revenue per student	69	167.5	89	139.7	27.8	69	320.7	188	406.3	-85.5
		(13.1)		(9.7)	(16.3)		(19.6)		(61.0)	(64.1)
Total student enrolment	141	215.9	182	185.6	30.3	141	314.4	207	295.4	19.0
		(18.2)		(12.7)	(22.1)		(25.7)		(22.9)	(34.4)
Total teacher positions	163	8.6	206	7.9	0.6	163	10.0	215	9.6	0.4
		(0.5)		(0.4)	(0.7)		(0.2)		(0.4)	(0.5)
Total working teachers	163	7.5	205	6.5	1.0	163	9.2	216	8.7	0.5
		(0.5)		(0.4)	(0.7)		(0.2)		(0.5)	(0.5)
Share of permanent classrooms	162	0.68	206	0.64	0.04	162	0.8	216	0.73	0.02
		(0.03)		(0.03)	(0.04)		(0.03)		(0.02)	(0.03)

Notes: Matching refers to schools contained in both the PEPE (2012) and PESD (2001/2002) samples. Full refers to the full sample of schools. Standard errors in parentheses. * indicates the difference in means across the matching and full sample is significantly different from zero at the 5% level based on a two-tailed test.

Table 2-A3: A comparison of means across matching and non-matching samples (health clinics)

	2001/2002					2012				
	Matching		Non-matching			Matching		Non-matching		
	N	Mean	N	Mean	Difference	N	Mean	N	Mean	Difference
Patient visits (typical day)	63	42.7	37	56.4	-13.7	63	35.7	72	38.62	-2.9
		(12.5)		(21.9)	(25.8)		(8.4)		(8.4)	(12.3)
Patient visits (yesterday)	58	33.8	31	55.7	-21.9	61	24.0	70	31.79	-7.7
		(13.2)		(37.0)	(39.9)		(7.1)		(8.8)	(11.7)
Health worker positions	63	4.8	37	4.7	0.16	63	4.8	71	5.84	-1.1
		(1.4)		(1.1)	(1.8)		(0.9)		(1.4)	(1.7)
Health workers regularly working	63	4.1	37	4.0	0.02	63	3.6	71	4.46	-0.9
		(1.3)		(0.9)	(1.6)		(0.7)		(1.2)	(1.4)
Panadol available	63	0.88	37	0.63	0.25	63	0.71	72	0.83	-0.1
		(0.08)		(0.12)	(0.15)		(0.12)		(0.08)	(0.15)
TB blister packs available	63	0.56	37	0.42	0.13	63	0.31	72	0.40	-0.1
		(0.13)		(0.13)	(0.19)		(0.10)		(0.11)	(0.15)

Notes: Matching refers to health clinics contained in both the PEPE (2012) and PESD (2001/2002) samples. Non-matching refers to health clinics only included in one rather than both survey samples. Standard errors in parentheses. * indicates the difference in means across the matching and non-matching sample is significantly different from zero at the 5% level based on a two-tailed test.

PART TWO:
A LOST DECADE?

3 PRIMARY SCHOOLS: 2002 TO 2012

3.1 Introduction

Buoyed by a resources boom, government funding for education substantially increased between 2002 and 2012. How has this funding affected the quality of school facilities and the number of teachers? Has the number of classrooms and teachers kept pace with enrolments and attendance? How has school governance and oversight fared? Was the last decade a good one for the education sector, or was it a lost decade? This chapter looks at findings from the 2002 (PESD) and 2012 (PEPE) surveys to answer these questions.

To do so it is split into six sections. Section 3.2 shows the accessibility of schools to key resources over the decade, while Section 3.3 examines the change in enrolment and attendance. The state of school facilities is examined in Section 3.4. Section 3.5 looks at changes to formal oversight and community engagement over the decade. Teacher numbers and performance are examined in Section 3.6. School financing is examined in Section 3.7. The conclusion sums up the chapter and reflects on what sort of decade it has been for primary education in PNG. The annex to this chapter includes a table of summary statistics for key variables.

Unless otherwise stated, the responses analysed in this chapter are from the Head Teacher surveys, and using the full 2002 and 2012 samples. 90 per cent confidence intervals (for figures) or standard errors (for tables) are shown for the national, decadal comparisons. Average ratios (for example, the ratio of students per teacher or the proportion of permanent classrooms) are calculated as the means of within-school ratios.

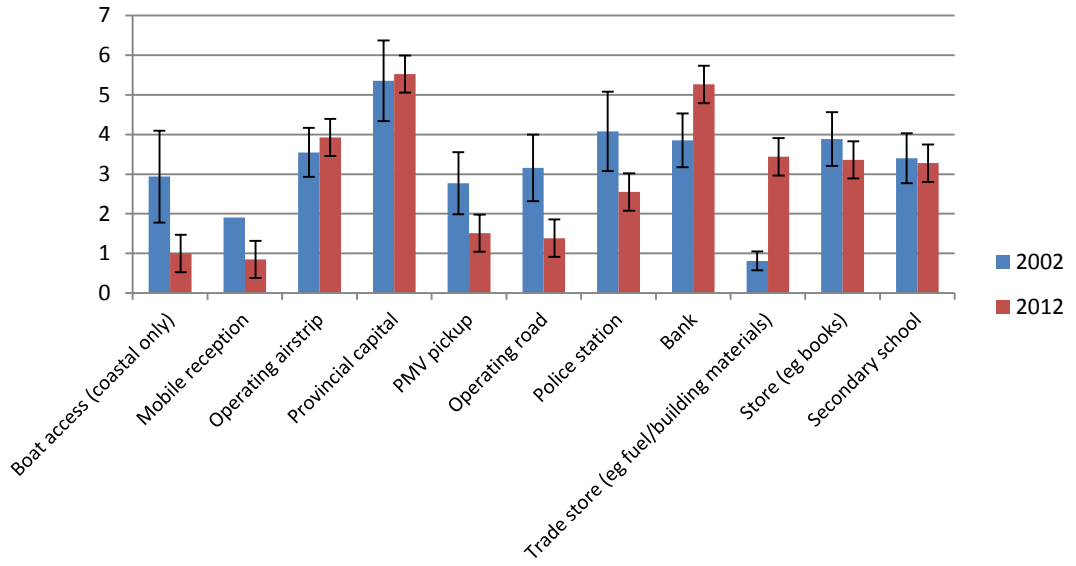
Overall, the chapter finds that the past decade has been one of expansion for primary schools. School enrolments have increased rapidly over the decade, and there are signs that more children are attending school; although absenteeism is on the rise. There are many indicators showing that school infrastructure has improved – classrooms are now more likely to be made of permanent materials and more have a chair and table for the teacher. Students have greater access to textbooks. Still, there are areas where investment is needed. Many teachers' houses and classrooms are in poor condition. Overcrowding has worsened, with teacher to student ratios deteriorating. Schools received 150 per cent more funding in 2012 than 2001. More funding makes oversight more important, but in 2012 only two-thirds of schools received a visit from a Standards Officer. While local school governance mechanisms are functioning and active, more

could be done to involve the community in overseeing and managing funds.

3.2 Access to infrastructure and resources

Schools in PNG face a myriad of challenges which they must overcome to provide students with a good education. For example, the structural constraints of remoteness restrict the ability of schools to hire (and keep) additional teachers and to maintain classrooms. Given this, an important first step in assessing progress and regress over the decade must include analysis of how access to key resources has changed. Figure 3-1 shows the number of hours Head Teachers estimated it took to get to key resources. It reveals that there have been some improvements in accessibility over the decade. Between 2002 and 2012, access to mobile reception, PMV (bus) pickup, and an operating road, significantly improved (Figure 3-1). For schools near the coast, it took less time to get to a boat. However, getting to a trade store selling fuel or building supplies took longer in 2012 than 2002.

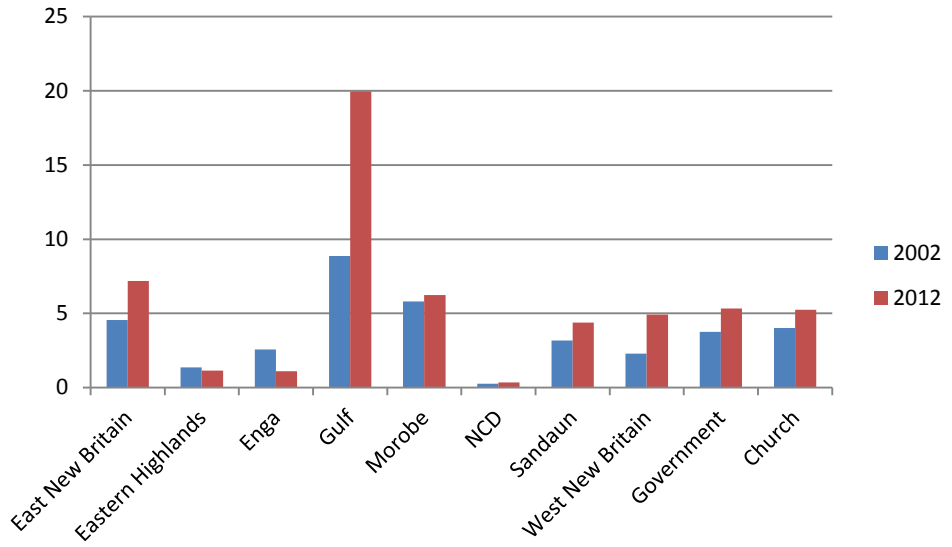
Figure 3-1: Hours to get to key resources from PEPE and PESD schools



Note: Error bars represent confidence intervals at the 90 per cent level throughout the report.

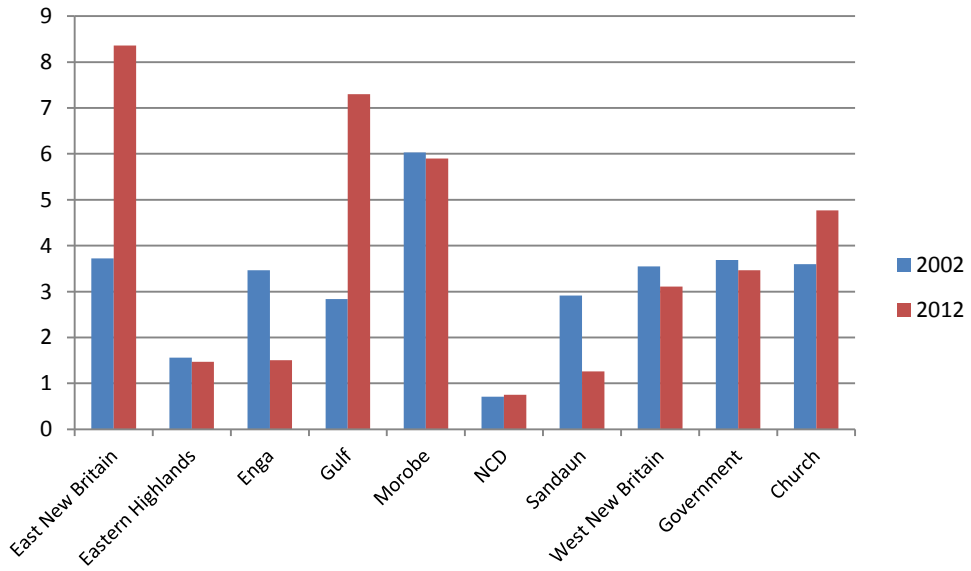
There are notable differences in accessibility between provinces and government and church facilities. Figure 3-2 shows that in 2012 it took twice as long to get to a bank in Gulf. The closure of the Bank of South Pacific's Kerema branch in 2008 is a key reason for this change. With the bank reopening in Kerema in June 2014, it is likely that these times have now reduced somewhat. Getting to a bank also took substantially longer in East New Britain, while most other provinces only recorded slight increases in time taken.

Figure 3-2: Hours to get to a bank by province, school agency



East New Britain recorded the longest time to get to an airport out of all the provinces in 2012 (Figure 3-3). Over the past decade travel time to an airport in this province more than doubled. This was mostly because of the closure of the Pomio district airstrip, which is located in the remote south-western corner of the province. Time taken to get to an operating airstrip also substantially increased in Gulf between 2002 and 2012.

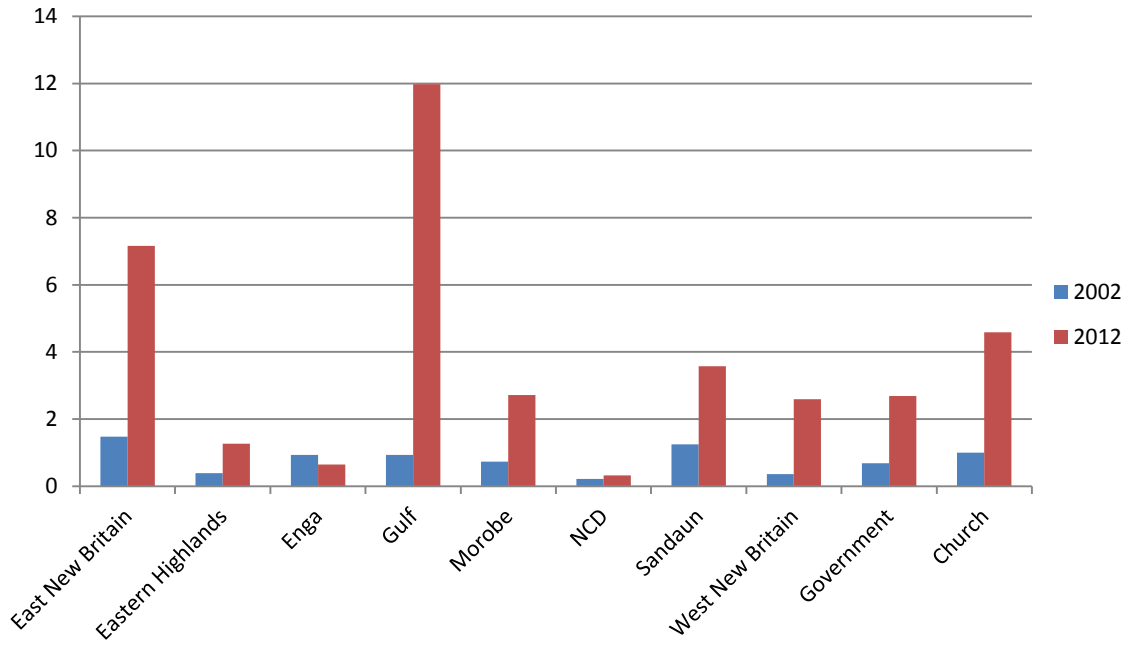
Figure 3-3: Hours to get to an operating airstrip, by province, school agency



All provinces except Enga and NCD saw substantial increases in the time taken to get to a trade store (Figure 3-4). In 2002 it took less than an hour to get to a trade store in most provinces; by 2012 it took 12 hours in Gulf, in East New Britain it took seven. Over the decade both government and church schools saw travel times increase. By 2012 it

took longer to get to a trade store from a church school than a government-run school.

Figure 3-4: Hours to get to a trade store, by province, school agency



The remoteness index we developed (see Chapter 2) showed that more schools were in very remote locations in 2012 compared to 2002. As Table 2-3 shows, their proportion doubled to 25 per cent of the sample in 2012. The remoteness index was devised with reference to five key resources. Expanding our analysis to include responses to the accessibility of 11 resources, as we have above, shows that the past decade has seen access to some resources improve, and to others worsen. Much of the deterioration in accessibility has been driven by Gulf, the most remote province in our sample. The findings also highlight the challenges that East New Britain faces, a province that, our subsequent analysis shows, performs better in the education sector than many others.

The reversals of accessibility are concerning as they relate to key school functions: airstrips provide remote schools with resources; banks are the source of school funding (including subsidy payments) and teachers' pay; and trade stores provide essential materials for building and maintenance of school buildings. However, improving access to these resources is mostly outside of the control of the education sector. This shows the importance that other sectors play in contributing to improved learning environments.

3.3 Demand for schooling: enrolments and attendance

Table 3-1 shows that between 2002 and 2012 there was a large increase in enrolments, with schools experiencing a 58 per cent

increase in student numbers.[9] This represents a significant increase in the enrolment rate given that the school age population grew by approximately 30 per cent over the same period. As we discuss in Chapter 5, a large part of this increase was due to the abolition of tuition fees in 2012. Chapter 5 also shows a large increase in enrolments between 2001 and 2002 (when tuition fees were temporarily abolished) giving a cumulative increase between 2001 and 2012 of 85 per cent.

Enga and Gulf featured the highest increase in student numbers, with a growth of over 85 per cent between 2002 and 2012. NCD was home to the largest schools: on average, they had over 1000 students enrolled in 2012. Church schools recorded higher growth than their government counterparts. As expected, given the high enrolment rates in NCD (a capital city with easy access to most resources), in 2002 and 2012 schools that were not remote had a higher *number* of students enrolled than those in remote areas. Interestingly, enrolments grew the most slowly where schools were either the most or the least remote. In the latter category, enrolment rates are already high, and in the former, the challenges of accessibility clearly remain daunting.

The share of girls among enrolled students rose sharply from 30 to 46 per cent. This implies that the number of girls enrolled in primary school grew over the decade by 144 per cent, and the number of boys by only 22 per cent.

Table 3-1: Comparison of average school enrolments

	Enrolment 2002	Enrolment 2012	Change 2002-2012	% Female 2002	% Female 2012
Overall	186	294	58%	30%	46%
	(13.4)	(18.5)		(0.7)	(1.7)
East New Britain	192	240	25%	21%	47%
West New Britain	165	246	49%	35%	46%
Morobe	104	174	67%	32%	56%
Sandaun	130	191	47%	36%	46%
Eastern Highlands	247	409	66%	21%	40%
Enga	282	530	88%	25%	41%
Gulf	109	202	85%	33%	45%
NCD	637	1,059	66%	37%	48%
Government	211	317	50%	30%	45%
Church	154	265	72%	30%	47%
Readily accessible	377	547	45%	33%	45%
Accessible	173	337	95%	31%	47%
Remote	111	223	101%	26%	47%
Very remote	95	143	51%	24%	45%

Note: Based on the Head Teacher survey and, where there are missing values, statistics from the NDoE. In all tables, standard errors are in parentheses.

9. Official NDoE enrolment numbers show an increase in primary school enrolments of 56 per cent over this period.

As the numbers of enrolled students increased, so too did student absence rates. The PEPE survey focused on Grade 5 classes. In 2012, only 71 per cent of students of the Grade 5 teachers' home class were present when the survey teams arrived, which compares poorly to the 84 per cent in 2002 (Table 3-2). In 2002 the attendance rate was 75 per cent or more in all provinces. By 2012 that dropped to close to 60 per cent in West New Britain, Sandaun and Gulf. The increase in student absence might be for several reasons. One is that the enrolment figures have become extremely important because as of 2012 each primary school gets K270 per student enrolled. This might lead to enrolment inflation. It is also possible that with a large increase in enrolments, a larger number of students are enrolled in school who have a lower level of commitment to attend. Finally, it is possible that if the quality of education has fallen (for example, due to over-crowding) more students might be deterred from attending school.

To understand the likelihood of students taking extended breaks we asked the Grade 5 teachers to tell us the number of their students that were absent for more than 10 days. Long-term absenteeism has increased, with the proportion of children absent for more than 10 days doubling between 2002 and 2012 (Table 3-2) – from 9 to 18 per cent. In 2012, overall, boys were more likely to miss school for long periods. Of those who were long-term absentees, one-third were girls in 2002 and 2012, less than their share in enrolments in 2012. This varied by province, with girls making up half of those away for long periods in Gulf in 2012. In Enga, girls' rate of absence has doubled over the decade. But in West New Britain, girls made up less than 30 per cent of long-term absentees.

Table 3-2: Proportion of Grade 5 students present and long-term absence (%)

	Present on the day of the survey		Missed more than 10 days		Girls who missed more than 10 days	
	2002	2012	2002	2012	2002	2012
Overall	84	71	9	18	35	35
	(1.2)	(2.1)	(1.0)	(1.2)	(3.5)	(2.0)
East New Britain	90	72	13	14	37	39
West New Britain	87	64	13	22	31	29
Morobe	90	69	6	23	28	28
Sandaun	83	62	9	15	29	37
Eastern Highlands	83	91	6	14	54	33
Enga	84	70	7	17	28	42
Gulf	77	61	19	20	39	47
NCD	85	76	12	16	39	42
Government	80	71	11	20	34	35
Church	88	73	7	15	39	33

Note: From the Grade 5 teacher survey.

Policy makers clearly need to put absenteeism, something which is little discussed in education policy in PNG, on the agenda. The National Department of Education's (NDoE) National Plan for Education (2004 to 2014) (NDoE, 2004) and its Universal Basic Education Plan 2010 to 2019 (NDoE, 2009) highlight the problems of teacher absence but are

silent on student absenteeism (they focus instead on retention). The increase in student absenteeism is a worrying development; it undermines some (but not all) of the gains of enrolment increases. Acknowledging and understanding the problem is the first step, seeking solutions is the next. To this end, more auditing of claimed enrolment figures could help: this is discussed further in Chapter 5.

If we combine the information in Tables 3-1 and 3-2 (assuming that all grades had the same increase in absenteeism), the increase in the number of children attending school would be 34 rather than 58 per cent over the ten year period, and 56 rather than 85 per cent taking 2001 as the base.[10] This lower but still large increase in the number of children attending school is reflected in the community's perception that more children are at school. 62 per cent of community representatives believed that most or all children were attending school in 2002. This increased to 70 percent in 2012 (Table 3-3). In East New Britain, West New Britain and Sandaun the proportion who said most or all attended school increased substantially over the decade. In Gulf, substantially fewer respondents said the majority of the community's children attended school in 2012 (37 per cent) compared to 2002 (63 per cent). In East New Britain, by contrast, the increase was from 37 to 90 per cent.

Table 3-3: Most or all children in the community attend school (%)

	2002	2012
Overall	62	70
	(3.2)	(4.0)
East New Britain	37	90
West New Britain	44	82
Morobe	66	52
Sandaun	67	83
Eastern Highlands	86	72
Enga	59	67
Gulf	63	37
NCD	70	77
Government	65	66
Church	59	76

Note: Percentage of parents (2002) and P&C Committee members (2012) saying that most children in their community attend school.

Increases in enrolments and attendance are to be welcomed, but how are school facilities coping with this influx? We examine this question in the following sections.

3.4 Classrooms, textbooks and facilities

This section highlights findings related to students' learning environment: it examines the change in classroom availability and condition; growth in textbooks; and the condition of key facilities that

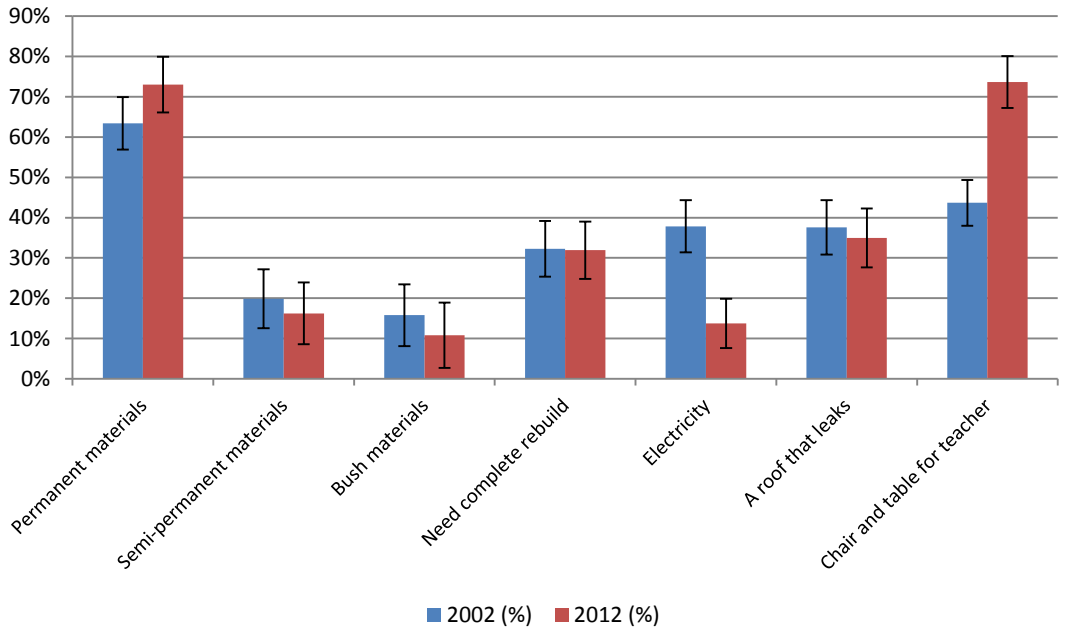
10. These are rough estimates, calculated using the sample means, and assuming absenteeism rates in 2001 and 2002 were equal.

aid learning. We also examine the condition of facilities for teachers, including staffrooms and teachers houses.

Classrooms

The NDoE's Universal Basic Education Plan for 2009 to 2019 (NDoE, 2009) aims for all primary school classrooms to be made of permanent materials by 2019. Figure 3-5 shows that there is still more that needs to be done to achieve this target as 27 per cent of classrooms were made of semi-permanent or bush materials in 2012. This was, however, down from 36 per cent in 2002. Compared to 2002, in 2012 the same proportion of classrooms needed to be completely rebuilt, and in both years a similar percentage had a roof that leaked when it rained. Still, there is evidence of improvement *within* the classroom: more classrooms had a chair and table for the teacher in 2012 compared to 2002. Classrooms that have access to electricity have halved (although as we show later in this chapter, access to electricity at the school level has increased).

Figure 3-5: Condition of classrooms (%)



The condition of classrooms varies greatly throughout the country. In 2012, in East New Britain and NCD over 89 per cent of classrooms were made of permanent materials and over 95 per cent had a chair and table for the teacher. In East New Britain only 15 per cent of classrooms needed to be rebuilt (Table 3-4). On the other side of the ledger, Gulf and Sandaun had the lowest proportion of classrooms made of permanent materials – less than 55 per cent. Enga had the lowest proportion of classrooms with a chair and table. Morobe had the highest proportion of classrooms needing to be rebuilt: 45 per cent required reconstruction in this province. Most provinces reported an improvement in the condition of classrooms over the past decade, yet

in Morobe, Gulf, Enga and NCD respondents said more classrooms required rebuilding in 2012 compared to 2002.

More government and church schools were built from better materials in 2012 and were more likely to have a chair and table for the teacher. However, a third of both church and government schools needed to be rebuilt in 2012. The condition of schools is also a function of remoteness. In 2012, fewer schools were made of permanent materials in remote areas, and the more remote the school the more likely its classrooms needed rebuilding.

The proportion of classrooms that do not need maintenance or rebuilding was unchanged over the decade. In 2002, only 29 per cent were in a good condition (not requiring maintenance or rebuilding) by 2012 it was 27 per cent.

Table 3-4: Condition of classrooms, disaggregated (%)

Percentage of classrooms	Made of permanent materials		With chair and table for the teacher		Needing rebuilding	
	2002	2012	2002	2012	2002	2012
Overall	63	73	44	74	32	32
	(2.4)	(2.0)	(2.9)	(2.3)	(2.2)	(1.9)
East New Britain	88	89	84	95	18	15
West New Britain	83	86	42	61	46	25
Morobe	66	69	50	91	27	45
Sandaun	33	52	35	80	50	40
Eastern Highlands	50	75	48	79	36	20
Enga	78	79	41	36	21	33
Gulf	56	54	44	49	29	42
NCD	92	100	79	100	20	23
Government	65	77	52	80	34	32
Church	63	68	44	73	31	31
Readily accessible	88	93	54	85	25	16
Accessible	53	77	44	76	37	30
Remote	64	73	50	88	31	34
Very remote	50	56	46	69	39	42

The number of classrooms at schools has increased over the decade. Table 3-5 shows that in 2012, on average, there were 8.4 classrooms per school, compared to 6.9 in 2002. Morobe and NCD had the biggest increases in classroom stock. The increase in classrooms has softened the impact of enrolment growth. The overall average number of students per classroom has increased by 20 per cent over the decade, to 32 students per classroom. This is a significant increase, but well below the 58 per cent increase in enrolments.

When taking out classrooms needing to be rebuilt from this calculation, so only considering functioning classrooms, the ratio of students-to-classrooms increases, as does the growth in number of students per classroom. In 2012 there was an average of 53 students per effective classroom, a 38 per cent increase from 2002. Students per functioning classroom were highest in NCD in 2012 (75 students per

functioning classroom). Morobe experienced the fastest increase over the decade. Enga, Eastern Highlands and West New Britain best managed to accommodate increasing enrolments: all these provinces saw less than a 10 per cent increase in the ratio of enrolled students per functioning classroom. West New Britain's performance shows the value of maintenance. By halving the number of classrooms requiring rebuilding, it was able to hold the growth of students per effective classroom to 9 per cent, despite a 49 per cent increase in enrolments.

While enrolments per classroom reduced as schools became more remote in 2012, remote schools had a similar ratio of students per functioning classroom compared to those in readily accessible locations.

If enrolment figures are inflated, as results from the Grade 5 teachers (Table 3-2) suggest they are, these numbers will exaggerate over-crowding. However, these results are still a cause for concern, particularly as students are less likely to attend overcrowded and dilapidated classrooms.

Table 3-5: Classrooms, and enrolled students per classroom and functioning classroom

	Classrooms per school			Enrolled students per classroom			Enrolled students per functioning classroom		
	2002	2012	Change	2002	2012	Change	2002	2012	Change
Overall	6.9	8.4	22%	26.7	32.0	20%	38.1	52.6	38%
		(0.4)	(0.3)		(1.0)	(1.35)		(3.1)	(6.5)
East New Britain	7.7	9.0	16%	25.9	25.6	-1%	27.7	40.6	46%
West New Britain	4.8	7.7	6%	30.3	29.4	-3%	41.2	44.8	9%
Morobe	5.7	6.2	54%	18.8	28.5	52%	25.1	53.8	114%
Sandaun	5.0	6.5	28%	27.4	30.2	10%	31.8	58.9	85%
Eastern Highlands	9.1	9.6	10%	26.1	42.4	62%	56.7	61.2	8%
Enga	8.4	12.9	6%	36.6	32.2	-12%	46.6	49.9	7%
Gulf	4.6	5.9	32%	25.6	24.7	-4%	31.7	37.4	18%
NCD	19.8	20.9	61%	41.1	53.4	30%	63.2	75.0	19%
Government	7.7	8.5	10%	28.1	33.2	18%	36.7	54.6	49%
Church	6.0	8.3	37%	25.0	30.0	20%	34.7	51.0	47%
Readily accessible	12.2	13.9	15%	33.3	35.4	6%	43.5	47.0	8%
Accessible	6.4	9.1	43%	27.8	35.3	27%	43.9	61.4	40%
Remote	5.1	6.3	24%	23.4	29.8	28%	32.0	47.2	47%
Very remote	4.4	5.7	26%	22.9	25.4	11%	33.3	45.8	38%

Textbooks

Averaging the availability of Grade 5 and 6 language and maths textbooks over schools, we find that textbook numbers increase over the decade – from 29.0 per subject and grade to 33.6, an increase of 16 per cent. The increase of textbooks was confirmed by Grade 5 teachers: 24 per cent said there were sufficient textbooks in 2002, this rose to 31 per cent in 2012.

There is a high degree of variability of textbook availability by grade and province. The decade has seen the availability of Grade 5 language textbooks decline in schools (Table 3-6). There were, on average, 10 fewer Grade 5 language textbooks in 2012 compared to 2002. On the other hand, overall, the availability of Grade 6 language and maths books more than doubled.

Teaching aids have not improved in availability over the decade. The percentage of Grade 5 teachers who could produce teaching aids was 79 per cent in 2002 and 78 per cent in 2012.

Table 3-6: Grades 5 and 6 maths and English textbooks per school

	Grade 5 maths		Grade 6 maths		Grade 5 language		Grade 6 language	
	2002	2012	2002	2012	2002	2012	2002	2012
Overall	42	38	19	39	42	32	15	33
	(3.0)	(3.0)	(2.4)	(2.2)	(1.8)	(3.7)	(1.9)	(2.2)
East New Britain	56	50	42	58	42	37	24	40
West New Britain	67	18	12	24	41	21	7	21
Morobe	39	28	15	26	51	25	8	27
Sandaun	57	35	29	38	53	27	27	27
Eastern Highlands	17	48	9	54	21	46	13	44
Enga	35	57	11	42	33	38	7	42
Gulf	31	35	13	31	45	28	18	28
NCD	44	48	32	52	83	42	46	47
Government	42	41	20	42	48	34	20	35
Church	41	34	17	36	36	30	11	31
Readily accessible	50	56	25	43	45	40	22	40
Accessible	36	37	17	41	40	36	13	37
Remote	44	36	18	36	44	35	11	37
Very remote	33	31	16	36	46	25	15	26

On a *per student* basis, the availability of Grade 5 and 6 textbooks has worsened slightly. The average student to textbook ratio for the two grades and subjects we surveyed across schools increased from 2.0 in 2002 to 2.2 in 2012. Again there was some significant variation by grade. Student per textbook ratios declined for Grade 6 maths and Grade 5 language textbooks but increased for Grade 5 maths and Grade 6 language textbooks increased (Table 3-7).

Table 3-7: Students per textbook, Grade 5 and 6

	Grade 5 maths		Grade 6 maths		Grade 5 language		Grade 6 language	
	2002	2012	2002	2012	2002	2012	2002	2012
Overall	1.5	2.1	2.3	1.8	3.0	2.4	1.3	2.1
	(0.3)	(0.3)	(0.4)	(0.3)	(0.6)	(0.4)	(0.3)	(0.3)
East New Britain	0.5	1.8	0.5	1.7	1.7	2.0	0.6	1.9
West New Britain	0.8	3.4	0.9	2.7	1.0	3.4	0.1	2.6
Morobe	2.0	1.4	2.0	1.0	3.4	1.2	1.9	1.1
Sandaun	1.6	1.0	1.5	1.0	1.1	1.7	0.3	1.6
Eastern Highlands	1.3	1.5	1.6	1.2	1.2	2.3	1.1	2.4
Enga	1.4	4.3	7.6	4.9	4.4	5.8	2.6	4.9
Gulf	1.8	1.8	3.0	1.2	10.6	2.1	1.8	1.1
NCD	4.6	4.1	6.6	3.5	6.7	4.4	3.3	3.5
Government	1.5	1.7	2.6	1.4	3.9	2.0	1.8	1.7
Church	1.5	2.6	2.1	2.5	1.9	3.2	0.7	2.9
Readily accessible	3.0	2.7	2.1	2.6	2.1	3.0	0.9	2.6
Accessible	1.6	2.9	2.3	2.6	2.4	3.5	1.0	3.0
Remote	0.9	1.1	2.4	1.1	5.1	1.4	1.1	1.5
Very remote	0.8	1.1	3.4	0.9	3.5	1.3	2.4	1.1

To put these findings in context, we can compare the numbers of textbooks in our survey to the targets of the NDoE and the Australian aid program, which distributed textbooks between 2010 and 2013. In its National Education Plan 2005-2014 (NDoE, 2004), the NDoE aimed for textbooks to be supplied at a ratio of two students to one textbook in lower primary and one-to-one in upper primary. The Australian aid program adopted the former target for primary schools; it aimed for all primary schools to have two students per textbook by 2015 (AusAID, 2010: 57). The Universal Basic Education Plan 2010 – 2019 (NDoE, 2009) goes further by calling for a ratio of one student to one textbook by 2019.

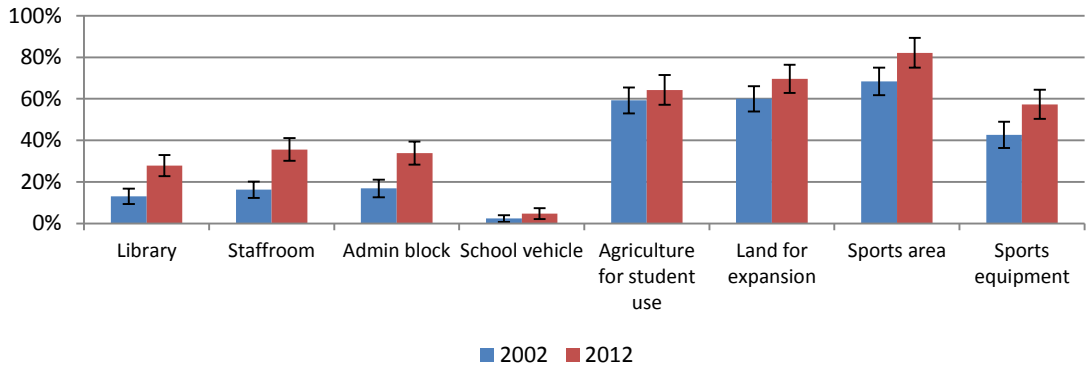
The good news is that the Australian aid program's target is almost being met: the ratio of two students to a textbook has largely been achieved. With rapid growth in the student population over this period, this is an impressive achievement. On the other hand, the NDoE is some way from reaching its 2019 target of one textbook per child. While in 2012 the average might be at two-students-per-textbook, in some schools – particularly those in NCD – it is well above this level. There are also questions about how the government will distribute textbooks now that the Australian aid program is no longer involved.

Facilities

While many are concerned that the quality of school infrastructure has gone backwards over the decade, we find that schools have seen a number of statistically significant improvements in the provision and quality of a range of key facilities. Between 2002 and 2012 the percentage of Head Teachers who thought there was an adequate or good provision of libraries, staffrooms, and administration blocks

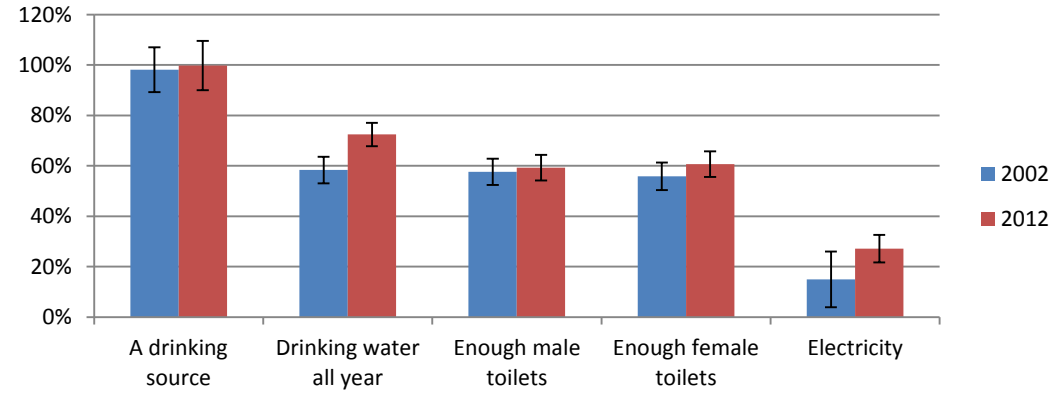
doubled (Figure 3-6). There was also a perception that the provision of other facilities improved, but not by as much.

Figure 3-6: Schools with adequate or good provision of facilities



Water and sanitation facilities have stayed the same or improved. All schools reported having a drinking source in 2012, which was similar to the situation in 2002 (Figure 3-7). Significantly, 72 per cent of schools are able to access drinking water all year, an improvement on the 50 per cent recorded in 2002. The provision of male and female toilets stayed the same over the decade; by 2012 only around 60 per cent of schools had enough toilets for both sexes. The percentage of schools with electricity doubled over the past decade: in 2012 only 27 per cent of schools had electricity, compared to 15 per cent ten years earlier.

Figure 3-7: Schools with water, toilets and electricity



The increase in available drinking water is a significant achievement. As illustrated in the box below, improving water supplies in schools has some very tangible benefits for students, teachers and the community.

Improving water access matters: the case of Tatana Primary School

Over the past ten years, Tatana primary school in NCD, one of the schools visited by researchers in both 2002 and 2012, has started to address what the PESD's qualitative report, *Wok Bung: A qualitative study of twelve primary schools in Papua New Guinea* (Guy, Paraide, Kippel, & Reta, 2003), identified as its most serious problem: an acute lack of water. The report noted that on most school days children had to take their own water, and that the school was often closed due to a lack of water supply. But in 2010 a water pump, supplied by InterOil, was installed to transfer water to the school.

Managed and housed by the President of the school's BoM, the tank pumps water to the school daily. This has meant that teachers do not have to leave the school to collect water, and that on most days children no longer have to bring their own water to school. The installation of an additional water tank on the school grounds has also helped secure water supplies. According to the Head Teacher, this has meant that students are at school longer and can better concentrate on their studies, rather than on getting a drink.

Teachers' houses

Like classrooms, the quality of materials used in teachers' houses improved over the decade. Overall there were more teachers' houses around schools: there were 5.2 in 2002 and 6.8 in 2012. More were made of permanent materials in 2012 (Figure 3-8), and fewer needed rebuilding. However, because they came from such a poor base in 2002, in 2012 teachers' houses were still in worse condition than classrooms. In 2012, 58 per cent of teachers' houses were made of permanent materials (Figure 3-8), compared to 73 per cent of classrooms (Figure 3-5); 38 per cent of teachers houses needed rebuilding, only 32 percent of classrooms were in such poor condition. The percentage of houses that did not require any maintenance or rebuilding increased, but not significantly, from 18 per cent to 20 per cent.

Figure 3-8: Condition of teachers' houses

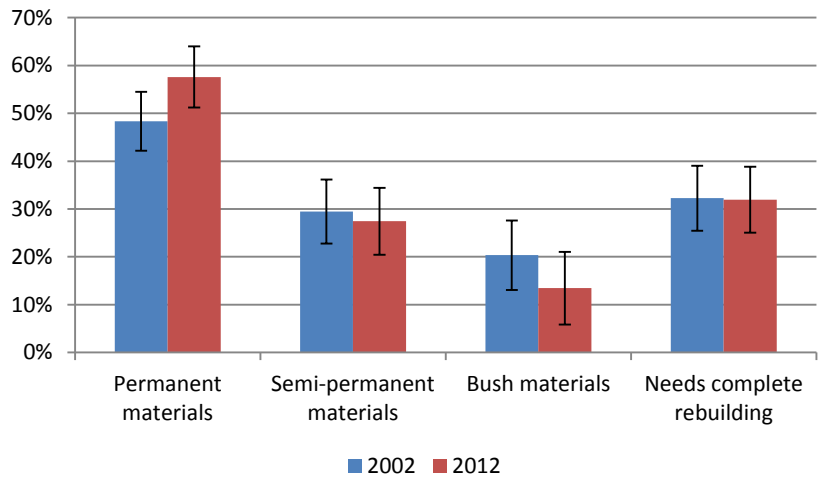


Table 3-8 shows that the demand for housing still exceeds supply: in 2002 and 2012 there were still about 2.5 teacher positions per functioning house (a house that didn't require rebuilding). NCD was the worst location for housing, it had 6.9 teachers to one effective house in 2012. Schools close to key resources had more teachers-per-functioning-house than remote schools.

Table 3-8: Teacher positions per functioning house

	2002	2012	Change
Overall	2.5	2.6	0%
	(0.1)	(0.1)	
East New Britain	3.1	2.0	-36%
West New Britain	1.7	2.2	32%
Morobe	2.2	2.2	2%
Sandaun	2.9	3.1	8%
Eastern Highlands	2.8	2.6	-8%
Enga	2.5	2.9	13%
Gulf	2.1	1.6	-22%
NCD	4.9	6.9	41%
Government	2.8	2.6	-5%
Church	2.1	2.5	19%
Readily accessible	3.3	3.3	2%
Accessible	2.6	2.8	8%
Remote	2.2	2.3	7%

3.5 Teachers

Teachers are essential for quality schooling; there needs to be enough turning up and teaching for students to learn. Table 3-9 shows the reported difference between the number of teacher positions to those actually working (who regularly turn up), and the increase in both. The number of teaching positions at the average school has increased from 7.9 to 9.6, and the number of teachers working has increased more from 6.5 to 8.7 per cent. The latter increase is statistically significant. It is also consistent with the fact that teacher numbers have been increasing in PNG. The teacher salary bill (including secondary teachers) has gone up by 25 per cent over the last ten years. NDoE statistics show that the total number of teachers in primary schools across the country increased from 21,653 in 2009 to 23,069 in 2012.

According to Head Teachers, the difference between teacher positions and those actually working decreased over the decade. In 2002 the difference between teacher positions and those working was 21 per cent, it dropped to 10 per cent in 2012. In both 2002 and 2012, Gulf reported the biggest difference between teacher positions and working teachers, while the gap was narrowest in NCD and East New Britain.

Table 3-9: Positions and working teachers, 2002 and 2012

	2002			2012		
	Positions	Working	Difference (%)	Positions	Working	Difference (%)
Overall	7.9	6.5	-21	9.6	8.7	-10
	(0.6)	(0.7)		(0.7)	(0.7)	
East New Britain	7.4	6.9	-7	9.2	9.0	-2
West New Britain	7.6	6.4	-19	9.4	8.7	-9
Morobe	5.7	4.8	-19	7.1	6.3	-13
Sandaun	5.9	4.5	-30	7.6	6.5	-17
Eastern Highlands	10.1	8.4	-20	11.2	10.4	-8
Enga	11.1	7.9	-41	15.1	13.7	-10
Gulf	4.4	2.8	-58	5.0	3.6	-38
NCD	23.8	22.9	-4	25.5	24.4	-4
Government	8.8	7.4	-19	9.9	9.1	-8
Church	6.9	5.5	-26	9.1	8.1	-13
Readily accessible	13.9	12.8	-9	16.0	16.1	1
Accessible	7.9	6.3	-26	10.7	9.6	-11
Remote	5.4	3.6	-48	7.5	6.3	-20
Very remote	4.8	3.5	-39	5.7	4.8	-20

The percentage of teachers absent on the day of the visit fell slightly between 2002 and 2012. The PESD report estimates an absence rate of 15 per cent in 2002, calculated by comparing those present with those said to be regularly working (World Bank and NRI, 2004, p. 71).[11] By 2012 that figure had fallen to 13 per cent. There will always be some absenteeism, due to ill-health or teachers being away on duty, but it is positive that the figure has fallen, or at least not risen

The number of "ghost teachers" appears to have dropped over the decade. The report on the 2002 PESD data (World Bank and NRI 2004) found that about 12-15 per cent of teachers were on the payroll for the schools surveyed in 2002 but were not regularly working. Our calculations suggest the percentage of reported ghost teachers is now negligible. Comparing our own data on teachers working with NDOE payroll data shows no differences at all (Table 3-10). This also confirms the accuracy of Education Management Information System (EMIS) data – as it shows that those on the system are likely working – which is available for 197 of the schools we surveyed. This does not mean that there are no ghost teachers at all (they might not be listed against schools, for example) but the results do suggest a significant improvement relative to 2002.

11. We recalculated other estimates but not this one from the PESD data due to the complexities of the data set in relation to this particular variable.

Table 3-10: Ghost teachers 2012

	Number of schools	Teachers on payroll	Teachers at school	Total ghost teachers	Ghost teachers (%)
PEPE 2012	214	2324	2331	-7	-0.29
EMIS 2012	197	1773	1760	13	0.71

Notes: EMIS is the Education Management Information System. EMIS data on the number of teachers at schools is provided by schools and is collected via the annual school census. Payroll data from NDoE for November 2012. PEPE data on number of teachers at schools is based on the Head Teacher survey (number of teachers regularly working).

Increases in teacher numbers have not been enough to compensate for growth of enrolments. Table 3-11 shows that student-per-teacher-position and students-per-working-teacher ratios have worsened. There are now more than 30 enrolled students per teaching position (up from 22 in 2002), and 36 students per working teacher (up from 31 in 2002). Morobe, Gulf, NCD and Eastern Highlands all saw high growth in both ratios over the decade. The stand out is East New Britain, where these ratios stayed the same or reduced, even though enrolments increased by 25 per cent (Table 3-1). Interestingly, the rate of increase in students attending school (based on the Grade 5 data shown in Table 3-2) is about equal to the rate of growth in working teachers, suggesting no increase in the number of attending students per working teacher from 2002 to 2012. However, as Chapter 5 shows, there are now some very large classes in some provinces and grades, and this might be deterring students from attending.

Table 3-11: Enrolled students per teacher position and working teacher

	Students per teacher position			Students per working teacher		
	2002	2012	Change	2002	2012	Change
Overall	21.8	30.3	39%	31.4	35.9	14%
	(0.6)	(1.1)		(1.5)	(1.6)	
East New Britain	25.6	25.0	-2%	27.8	25.9	-7%
West New Britain	18.8	22.5	20%	24.3	26.3	8%
Morobe	17.4	26.4	52%	23.9	41.5	73%
Sandaun	21.1	26.6	26%	30.9	31.7	2%
Eastern Highlands	23.8	38.3	61%	33.8	44.2	31%
Enga	24.4	36.4	49%	41.2	45.1	9%
Gulf	25.8	48.9	89%	50.1	78.5	57%
NCD	26.9	40.9	52%	29.6	41.5	40%
Government	22.5	30.5	36%	32.5	34.9	7%
Church	21.2	29.4	38%	30.7	37.5	22%
Readily accessible	26.2	34.8	33%	32.7	31.7	-3%
Accessible	21.5	30.1	40%	32.4	36.1	11%
Remote	20.3	31.2	54%	32.9	37.4	14%
Very remote	20.3	28.4	40%	30.0	38.5	28%

Notes: The students-per-teacher-position ratio is lower than the students-per-working-teacher ratio in all but one instance: in 2012 readily accessible schools were the exception. This could be because teachers are working in schools close to key resources even though they are posted elsewhere.

Gender

There are now more women in leadership and teaching positions in PNG schools. Between 2002 and 2012 the percentage of female Head Teachers (or acting Head Teachers) doubled (Table 3-12). There was much variation across the provinces, however. In 2012, two-thirds of NCD Head Teachers were women; yet, in Enga only 3 per cent were women. Sandaun stands out as the one province where the number of female Head Teachers fell over the decade. The proportion of female Grade 5 teachers almost doubled – from 27 per cent in 2002 to 55 per cent in 2012. Again, the variation between provinces was stark. While three-quarters of Grade 5 teachers were female in West New Britain this dropped to 30 per cent in Enga.

Table 3-12: Percentage of female Head Teachers and Grade 5 teachers

	Head Teacher (%)		Grade 5 Teacher (%)	
	2002	2012	2002	2012
Overall	13	27	27	55
	(2.2)	(2.8)	(3.1)	(3.2)
East New Britain	10	42	46	60
West New Britain	34	29	45	75
Morobe	7	33	27	71
Sandaun	17	10	16	47
Eastern Highlands	14	28	20	33
Enga	3	3	24	30
Gulf	0	20	7	46
NCD	33	63	50	71
Government	15	31	27	59
Church	10	19	26	49

Note: These figures are based on the gender of the Head Teacher and Grade 5 survey respondent respectively.

Length in position and willingness to continue

In both 2002 and 2012, on average, Head Teachers had been at their school for three years, but this varied greatly by province (Table 3-13). By 2012 Head Teachers in NCD had stayed at the schools for the longest, almost five years. On average, Grade 5 teachers stayed longer at their school than Head Teachers. In 2012, they had been at their current school for over four years; Grade 5 teachers in NCD and Enga had been in place for six and over seven years respectively.

Are Head Teachers and Grade 5 teachers motivated to continue? Yes for Head Teachers, no for Grade 5 teachers. Table 3-14 shows that only one quarter of Grade 5 teachers said they want to continue in 2012; this compares poorly to the over 80 per cent of Head Teachers who said they wanted to stay on. In Enga, NCD and Sandaun only 10 per cent of Grade 5 teachers wanted to continue. The difference in motivation between Head Teachers and Grade 5 teachers is likely related to the condition of teachers housing, which likely impacts teachers more than Head Teachers (from our field visits we were told that Head Teachers generally had better housing, or at least better options for housing. In

addition, if the Head Teacher has poor housing they have less time to wait to transfer to another school).

Table 3-13: Experience with school and desire to stay at school

	Years at school			Wants to stay at school		
	Head Teacher		Grade 5	Head Teacher (%)		Grade 5 (%)
	2002	2012	2012	2002	2012	2012
Overall	3.0	3.1	4.3	84	87	24
	(0.2)	(0.2)	(0.3)	(2.5)	(2.1)	(2.8)
East New Britain	3.4	2.3	4.7	65	83	30
West New Britain	2.3	1.9	3.3	71	89	25
Morobe	3.1	3.6	4.1	92	82	34
Sandaun	2.7	2.8	4.1	76	80	10
Eastern Highlands	2.6	3.8	4.1	85	97	23
Enga	3.7	3.3	7.6	93	100	10
Gulf	3.4	3.1	2.3	100	82	36
NCD	2.8	4.8	6.2	87	83	11
Government	2.5	3.0	5.0	77	86	24
Church	3.3	3.4	3.6	90	86	24

Note: Responses from Head Teacher and Grade 5 surveys.

Performance

In 2002 and 2012 P&C Committee members were asked about the performance of teachers. In both years, about two-thirds thought teachers always or often spent their days teaching, but the percentage responding that teachers were on time fell from 69 to 59 per cent, a significant reduction (Table 3-14). Teachers were most likely to be perceived to be on time in East New Britain and Enga, but most tardy in Morobe and NCD in 2012. Perceptions of government teachers worsened over the decade, while perceptions about church teachers improved. By 2012, perceptions of the latter group were significantly more favourable than of the former.

Table 3-14: Perceptions about teachers from parents/P&C members (%)

Percentage who said teachers always or often…	In class on time each day		Spend days teaching	
	2002	2012	2002	2012
Overall	69%	59%	68%	65%
	(3.0)	(3.1)	(2.4)	(3.0)
East New Britain	60%	84%	73%	87%
West New Britain	82%	72%	82%	74%
Morobe	69%	33%	66%	44%
Sandaun	80%	73%	80%	60%
Eastern Highlands	72%	52%	57%	69%
Enga	48%	80%	57%	83%
Gulf	72%	57%	72%	71%
NCD	39%	23%	57%	46%
Government	76%	50%	66%	57%
Church	60%	74%	72%	77%

Note: Responses from parents/P&C members.

Pay

There are mixed results when it comes to teachers' pay (Table 3-15). On the positive side, more Grade 5 teachers were getting paid at the right grade and paid on time in 2012 compared to ten years before. However, it takes teachers an average of 17 hours to access their pay, which costs them 288 kina per trip. Only one-third of teachers were paid the correct allowances in 2012, unchanged from 2002. There were also a third of teachers who sought additional income from their teaching job in 2002 and 2012.

Table 3-15: Teacher pay

	Paid at proper pay grade (%)		Paid on time (%)		Time taken to access pay (hours)	Cost to access pay (kina)	Paid eligible allowances (%)		Alternative income (%)	
	2002	2012	2002	2012	2012	2012	2002	2012	2002	2012
Overall	52	89	65	85	17	288	35	34	30	27
	(3.9)	(2.0)	(3.3)	(2.0)	(2.0)	(47)	(3.5)	(3.1)	(2.8)	(3.2)
East New Britain	42	87	70	97	8	70	27	38	42	57
West New Britain	86	94	65	75	23	767	45	25	23	31
Morobe	52	92	75	82	32	291	33	24	50	22
Sandaun	43	90	32	73	22	517	4	17	21	27
Eastern Highlands	53	93	67	100	4	86	39	67	21	17
Enga	40	83	87	93	3	32	30	17	8	10
Gulf	44	78	48	63	14	220	67	56	35	22
NCD	56	75	80	96	2	10	83	63	20	39
Government	55	86	70	89	15	272	35	37	32	24
Church	46	94	57	83	22	328	31	32	30	29

Notes: From Grade 5 teacher survey.

3.6 Formal oversight, community engagement and school management

Schools are subject to two types of oversight to promote accountability and transparency. The first is from government officials – including Standards Officers, and District Education Officers and Advisors. The second comes through the community via the BoM and P&C Committee. In this section we look at the effectiveness of these types of oversight and how they have changed over time. We also examine the way schools are internally managed.

Government oversight

In the Universal Basic Education Plan (2010 to 2019), the NDoE aims to have 80 per cent of schools receiving a Standards Officer visit by 2019. Our findings suggest that there is still a way to go before this goal is realised. Table 3-16 shows the percentage of head teachers that said that their schools received a visit from a Standards Officer. It also shows that, on average, just over half of schools received a visit from a Standards Officer in 2001, and two-thirds in 2011 and 2012, a

statistically significant increase. In 2012, NCD and Enga had the highest rate of inspections; West New Britain had the lowest, with less than half of schools reporting a Standards Officer visit. Church and government schools were similarly likely to receive a visit across the three years. On average, the number of Standards Officer visits was similar in 2001, 2011 and 2012 (the dip in visits in 2012 can be explained by the timing of the survey, which occurred late in 2012). Visits were more frequent in Enga and NCD in all three years. There was little difference between government and church schools, but in all years the more remote schools received fewer visits.

81 per cent of schools received a visit in either 2011 or 2012, suggesting that the NDoE target is currently being met over a two-year rather than an annual interval.

In 2012, 62 per cent of Standards Officers observed classes, slightly up from 58 per cent in 2002. More Standards Officers checked school records: from 56 per cent in 2002 up to 68 per cent in 2012. We look at how often the Standards Officers check subsidy payments in Chapter 5.

Table 3-16: Percentage of schools with at least one Standards Officer visit; number of visits per year

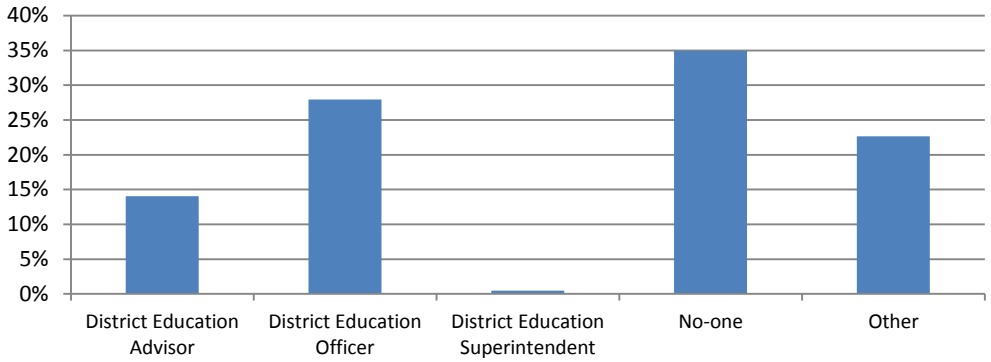
	One or more visit per year (%)			Number of visits		
	2001	2011	2012	2001	2011	2012
Overall	56	65	64	1.3	1.5	1.2
	(3.1)	(3.0)	(3.0)	(0.1)	(0.1)	(0.1)
East New Britain	57	72	72	1.1	1.6	1.6
West New Britain	50	42	48	1.2	1.0	0.7
Morobe	43	73	60	1.3	1.3	0.8
Sandaun	70	65	65	1.0	1.3	1.3
Eastern Highlands	55	58	58	1.3	1.3	0.9
Enga	80	87	87	2.1	2.5	1.9
Gulf	34	43	62	0.6	1.1	1.2
NCD	80	83	87	3.8	3.9	3.8
Government	57	64	62	1.4	1.4	1.1
Church	57	66	67	1.2	1.5	1.2
Readily accessible	76	68	68	2.4	2.0	1.8
Accessible	58	70	74	1.3	1.8	1.2
Remote	43	60	60	0.8	1.2	0.7
Very remote	54	61	70	0.9	1.0	0.9

Notes: Number of visits calculated based on all schools – not just those visited by a Standards Officer. As some schools received no visit the average can drop below one, as it does in Gulf. The overall average number of Standards Officer visits out of only those schools that received a visit increased from 1.9 in 2001 to 2.1 in 2011.

In 2012 we asked who else besides the Standards Officer inspected the school, a question not included in the 2002 survey. 65 per cent of Head Teachers said someone other than the Standards Officer inspected the school in 2012; mostly the school was visited by a District Education Officer (Figure 3-9). The District Education Officer and District Education Advisors are different from the Standards Officers as they

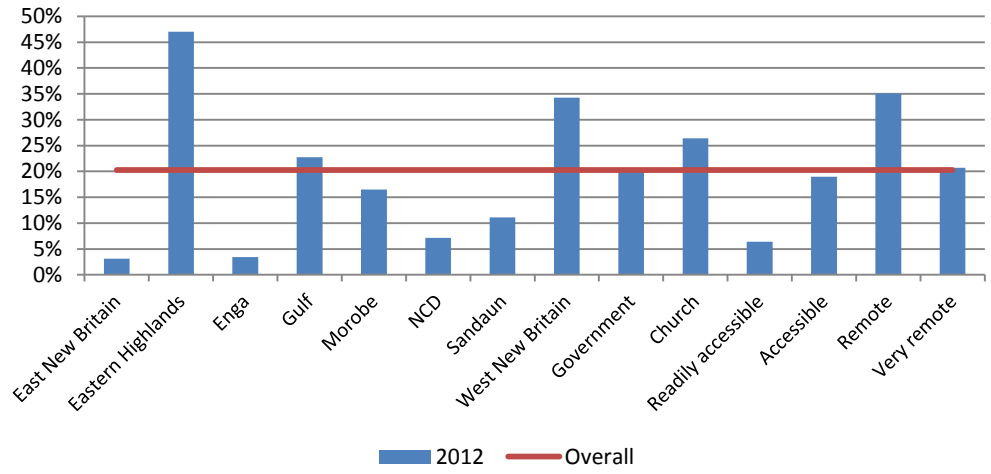
report to the provincial administration, the latter reports to the NDoE. A third of respondents said that no-one else inspects the school.

Figure 3-9: Other than the Standards Officer, who else inspects the school (2012, %)?



Overall, Figure 3-10 shows that 20 per cent of schools did not receive an inspection from anyone in 2012, neither from the Standards Officer nor anyone else. Eastern Highlands and West New Britain were least likely to receive a visit. On the other hand, over 90 per cent of schools in East New Britain and Enga received a visit. Schools in readily accessible locations were more likely to receive a visit.

Figure 3-10: Percentage of schools without an inspection from anyone (2012)



Community engagement

As outlined in Chapter 1, the BoM and P&C Committee play a critical role in school governance. Table 3-17 shows the make-up of the BoM and P&C associations and details about attendance. As Chapter 1 notes, the BoM should consist of at least seven members. On average this minimum was exceeded: in 2012, there were on average 8 members, in 2002, 8.8. The percentage of women on the BoM remained the same over the decade: one-fifth of BoM members were female. In addition, more BoM members were parents of children in 2012 compared to 2002. The average BoM in our sample met four times

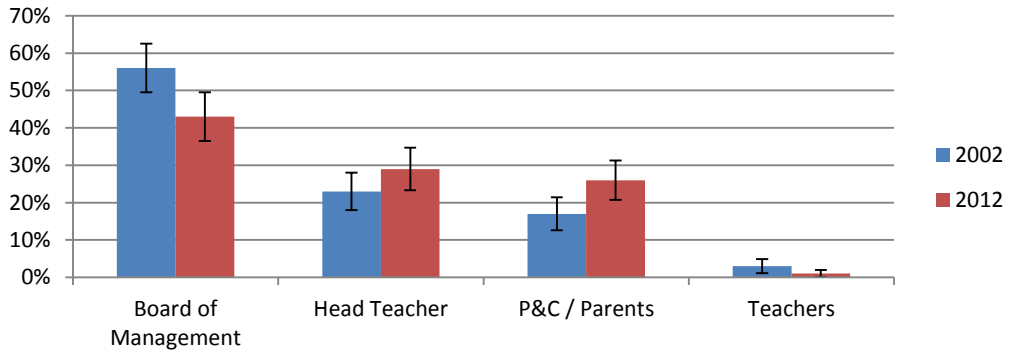
annually in both 2001 and 2012. Nearly all schools had a P&C Committee in 2002 and 2012 and, on average, they met three times annually in 2001 and 2012.

Table 3-17: The BoM and P&C by the numbers

Response	%/#	Value
Average number of BoM members (2002)	#	8.8
Average number of BoM members (2012)	#	8.0
Percentage of female BoM members (2002)	%	23
Percentage of female BoM members (2012)	%	22
Percentage of BoM members parents (2002)	%	32
Percentage of BoM members parents (2012)	%	38
Number of BoM meetings on average (2001)	#	4.0
Number of BoM meetings on average (2012)	#	4.0
Schools with a P&C Committee (2002)	%	95
Schools with a P&C Committee (2012)	%	96
Number of P&C meetings (2001)	#	3.7
Number of P&C meetings (2012)	#	3.9

While P&C Committees are meeting, members do not have much say in determining the P&C's activities. According to the Head Teacher, the BoM, followed by the Head Teacher, had the most say over P&C activities (Figure 3-11).

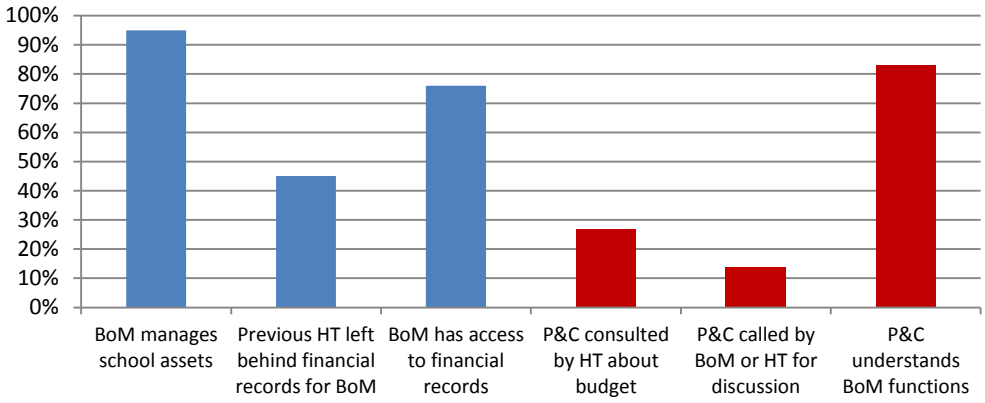
Figure 3-11: Most say over P&C Committee activities



There are also some mixed results regarding the involvement of the BoM and P&C Committees in managing school finances. As highlighted in Figure 3-12 (which presents responses from BoM and P&C Committee members), 95 per cent of BoM respondents said they managed school assets, but only 76 per cent said that they were provided with reasonable access to financial records. The critical job that the BoM plays in helping to manage school finances is further hampered when Head Teachers leave. Less than half of all respondents from the BoM said Head Teachers left behind financial records when they left the school. The P&C Committee's level of engagement in budgeting is even worse. Only 27 per cent said they were consulted about the budget and 14 per cent said they were called to discuss school issues with the BoM or Head Teacher. Despite this, P&C Committee members appear to have a grip on the way community

oversight is supposed to work: over 80 per cent said that they understood the BoM's functions.

Figure 3-12: The BoM and P&C access and management of finances (%, 2012)



Notes: First three responses from BoM survey, second three from P&C.

Despite its constraints, there are signs that the BoM is functioning well – though there is room for improvement. Two-thirds of P&C members believed the BoM had effectively managed the school in 2012, 10 percentage points down from 2002 (Table 3-18). In 2012 respondents in Enga and Sandaun were particularly enthusiastic about the BoM's management: in both these provinces almost 90 per cent of respondents in believed the BoM was well managed. This is in stark contrast to Eastern Highlands (25 per cent), NCD (48 per cent) and Gulf (51 per cent).

Table 3-18: Parents and P&C views on the BoM

	BoM is effectively managed (%)	
	2002	2012
Overall	77	67
	(3.2)	(4.2)
East New Britain	75	67
West New Britain	75	77
Morobe	76	75
Sandaun	77	87
Eastern Highlands	80	25
Enga	85	87
Gulf	76	51
NCD	48	48
Government	74	63
Church	79	72

Notes: From P&C survey.

Community interaction with the school has been shown to be an important contributor to successful schools in PNG (World Bank and NRI, 2004) and in other developing countries (World Bank, 2009). The proportion of P&C members and parents who said that the Head Teacher interacted with the community was stable over the decade. In

2002 46 per cent said that the Head Teacher mixes with the community, compared to 49 per cent in 2012.

School management

Within schools, there has been a decentralisation of decision making over the past ten years. By 2012 twice as many Head Teachers and a third more Grade 5 teachers said Head Teachers dominated decisions about class size (Table 3-19). This came at the expense of those external to the school (National Government, Standards Officers, Provincial Government). When it came to evaluating student performance, teachers were in charge in 2012, followed by Head Teachers. Teachers' say in student performance increased over the decade, while Head Teachers' involvement declined. This is probably a result of larger schools, which requires the Head Teacher to delegate more.

Table 3-19: Most say on class size and student performance (%)

Most say on…	Deciding class size				Evaluating student performance			
	Head Teacher		Grade 5 teacher		Head Teacher		Grade 5 teacher	
	2002	2012	2002	2012	2002	2012	2002	2012
BoM	1	11	11	16	3	2	4	3
District government	1	2	4	1	0	0	1	1
Head Teacher	37	72	44	63	52	37	37	30
National government	23	1	9	3	1	0	-	-
P&C / parents	0	1	0	1	0	1	0	0
Provincial government	6	2	14	4	2	1	3	0
Standards Officer	19	2	5	0	5	1	3	2
Teachers	15	9	14	12	37	54	51	63
Other	0	0	0	0	0	3	2	1
Total	100	100	100	100	100	100	100	100

Notes: From Head Teacher and Grade 5 teacher surveys.

This decentralisation of decision making is also apparent in aspects of human resource management. Table 3-20 shows that the Head Teacher is playing a much stronger role in evaluating teacher performance and in-service training selection. The Head Teacher was the key decision maker in these areas in 2012. Decentralisation has meant that the role of provincial governments in schools has declined across the board, although they still have the most say in teacher appointments (Table 3-20).

Table 3-20: Most say on human resources (%)

Most say in…	Appointing a teacher				Evaluating teacher performance				Selection for in-service training			
	Head Teacher		Grade 5 teacher		Head Teacher		Grade 5 teacher		Head Teacher		Grade 5 teacher	
	2002	2012	2002	2012	2002	2012	2002	2012	2002	2012	2002	2012
BoM	3	16	7	24	3	4	3	20	0	1	0	7
District government	5	12	2	7	0	3	0	1	1	4	1	3
Head Teacher	1	8	3	8	42	73	43	57	17	60	28	52
National government	8	1	7	1	2	0	1	0	5	0	4	0
Other	7	16	3	12	0	3	1	2	0	6	0	2
P&C / parents	2	0	1	0	0	0	0	0	0	0	0	0
Provincial government	71	35	74	24	6	0	5	0	47	7	41	5
Standards Officer	2	12	2	23	45	16	46	17	28	17	21	19
Teachers	0	1	1	0	1	1	1	2	2	5	5	11
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Notes: From Head Teacher and Grade 5 teacher surveys.

3.7 School funding

Funding at the school level has improved substantially and significantly over the decade. Table 3-21 shows that, adjusted for inflation, schools received 112 per cent more per student in 2012 than in 2001. (We use 2001 for comparisons because 2002 was an exceptional year, due to the temporary abolition of tuition fees.) With more students, the average school received 150 per cent more funding. Not all provinces fared well over the decade however; Gulf saw a drop in revenue per student; in NCD funding per student was essentially the same.

Table 3-21: Revenues per school and per student

	Revenue per school			Revenue per student		
	2001	2012	Growth	2001	2012	Growth
Overall	35,031	87,486	150%	159	336	112%
	(6,972)	(6,490)		(11)	(21)	
East New Britain	28,579	89,491	213%	170	357	110%
West New Britain	50,284	82,228	64%	193	342	78%
Morobe	22,541	65,588	191%	198	463	133%
Sandaun	12,469	55,135	342%	129	306	137%
Eastern Highlands Province	18,420	97,241	428%	110	268	144%
Enga	38,226	147,297	285%	133	286	115%
Gulf	9,920	27,069	173%	173	155	-10%
NCD	204,226	309,248	51%	281	292	4%
Government	34,816	91,498	163%	136	344	162%
Church	35,529	81,425	129%	180	326	46%
Readilly accessible	85,065	205,479	142%	179	332	61%
Accessible	25,285	111,339	340%	150	316	127%
Remote	15,478	72,623	369%	146	240	28%
Very remote	11,838	36,515	208%	160	399	77%

Notes: Total revenue and revenue per student are measured in 2012 kina. Revenue per student is calculated as the ratio of total revenue to enrolled students within each school. One school in Morobe and the very remote category reported receiving grant funding from the National Government of 200,000 kina or 2632 kina per student; removing this effect reduces revenue per student in Morobe to 366 kina and for the Very Remote category to 313 kina.

Due to the Tuition Fee-Free (TFF) policy, which is examined in Chapter 5, schools received 82 per cent less from parents, or K58 (Table 3-22). Funding from provincial governments is more or less unchanged, but at only K7 per student. The reduction in fee income has been more than compensated for by massive increases in national government funding of K201 per student, as well as a smaller increase (K35) from other actors, such as donors and churches. Schools are not just better off because of the abolition of tuition fees in 2012, and large increase that year in subsidy payments. Rather our more detailed analysis in Chapter 5 of the TFF policy (see Table 5-2 and related discussion) suggests that schools have seen their financial position significantly improve over a number of years.

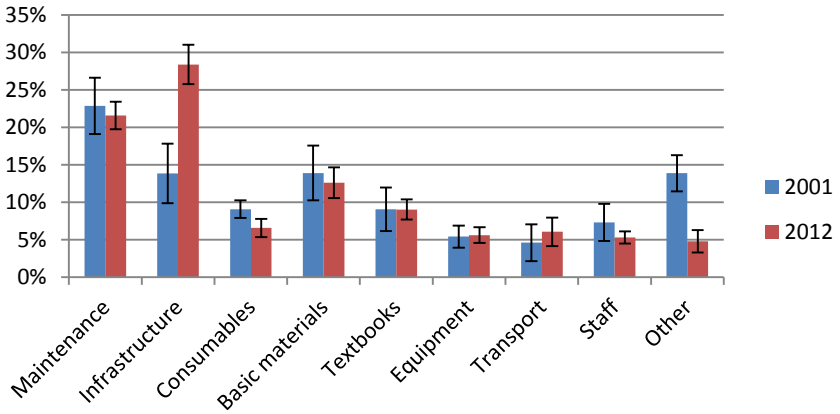
Table 3-22: Revenues per student by source

Source of revenue:	2001	2012	Growth
Parents	70	12	-82%
	(8)	(1)	
National Government	48	249	419%
	(3)	(9)	
Provincial Governments	7	7	-11%
	(2)	(2)	
Other (donors, church, other government, etc.)	33	68	103%
	7	(19)	
Total	159	336	112%
	(11)	(21)	

Notes: The data are measured in 2012 kina. Standard errors are in parentheses. Revenue per student is calculated as the ratio of revenue to enrolled students within each school.

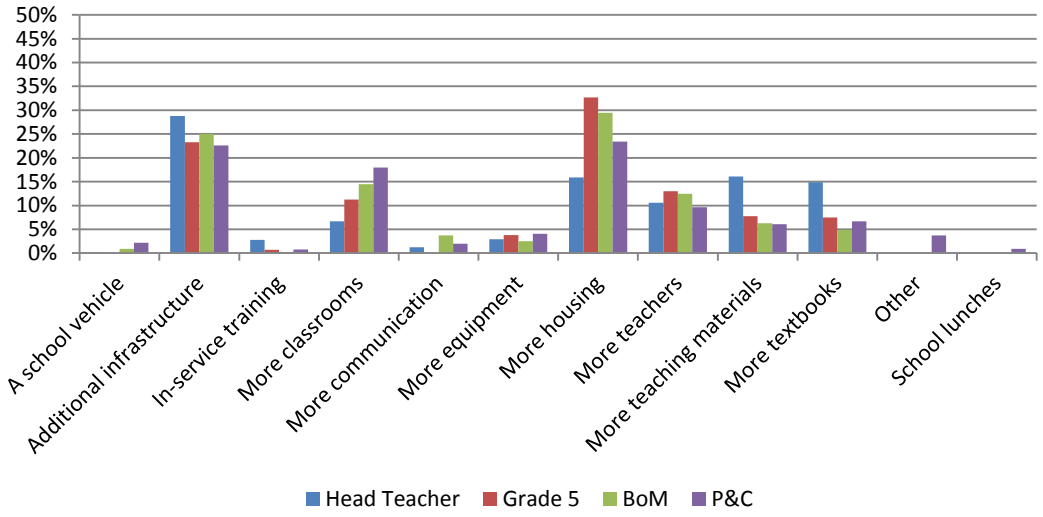
What are schools spending all this money on? According to the Head Teachers, spending on infrastructure has increased markedly over the decade to become the largest spending item in 2012 (Figure 3-13). Maintenance was the second largest spending item in 2012, similar to 2001 levels. Basic materials used to aid teaching as well as textbooks were also popular items in 2001 and 2012.

Figure 3-13: Percentage of school spending by category



Even though infrastructure was already the number one spending category, when asked what they would purchase if more funding was available, respondents wanted even more infrastructure (including teachers' housing and classrooms). Most Head Teachers said additional infrastructure was their number one priority, while Grade 5 teachers and representatives of the BoM selected teachers' houses as most important (Figure 3-14). General infrastructure and teachers' houses were of similar importance for those from P&C Committee. More classrooms, teachers, teaching equipment and textbooks were also popular options; school vehicles, in-service training, communication, equipment and school lunches were not.

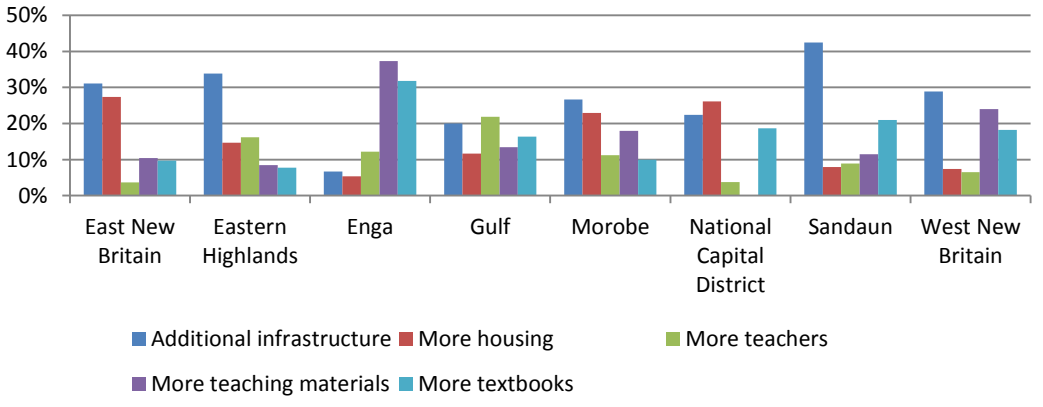
Figure 3-14: First preference for spending by respondent (2012)



Notes: From the Head Teacher, BoM, Grade 5 teacher and P&C surveys.

Funding preferences differed significantly by province, as Figure 3-15 highlights. Head Teachers wanted additional infrastructure in East New Britain, Eastern Highlands, Morobe, Sandaun and West New Britain. In Enga teaching materials were most desired, NCD prioritised teachers' houses, while Gulf wanted more teachers.

Figure 3-15: First preference for spending by province (2012)



Notes: From the Head Teacher survey.

3.8 Conclusion

Between 2002 and 2012 schools benefitted from some significant improvements in access to infrastructure: it is now easier to get to a PMV, get to mobile coverage, and get to a road. At the same time, in Gulf and East New Britain it is harder to get to a bank, operating airstrip, and a trade store to buy building supplies. These obstacles disadvantage schools and require whole–of-government solutions. Part of the solution may be technical. For example, mobile phones can be used to provide teaching plans as well as banking services to teachers and school administrators in remote locations. Addressing these constraints will also involve promoting equitable economic development and providing improved infrastructure, such as roads. Clearly, the problems that schools face are in part determined by government departments other than the NDoE.

There is much to be learnt from places that have overcome these obstacles. In this study, East New Britain offers an example of a province that faces problems in access to key resources yet has managed to perform well in terms of other education indicators (for example, teachers are most likely to be on time and teach). More research is needed to understand why places like East New Britain overcome their obstacles while others do not.

Schools now have significantly greater funding at their disposal, with most of the increase coming from the national government. Increases in revenue are important, but more needs to be done to ensure that it is spent well. Standards Officers need to be visiting more frequently. BoM members and P&C Committee members should be more involved in overseeing spending.

Increases in demand show that more parents want to send their children to school, a good outcome. But policy makers need to be wary of the affect that increasing student absenteeism has on access to education – our findings suggest that absentee rates are increasing and, in turn, undermining the impact of enrolment increases. Addressing student absenteeism should be prioritised by policy makers; it is an issue that is currently not given sufficient attention.

According to our results, more teachers were regularly working in 2012, and the number of ghost teachers has fallen, but these positive developments have not been enough to make up for increased enrolments. More teachers are needed. The consequences of the pressure placed by enrolment increases on infrastructure and human resources are further investigated in Chapter 5.

Teachers also need to be better motivated. It is noticeable that teachers at church schools score significantly higher in terms of the community perception of the time they spend teaching, and whether they turn up on time. Our survey also highlights two key issues which are sure to add to teacher dissatisfaction and that need attention from policy

makers: non-payment of allowances and the poor state of teachers' houses.

Supporting teachers' concern about their living conditions, there is great support for further spending on infrastructure more generally. The importance of addressing infrastructure needs is witnessed in the high proportion of teachers' houses and classrooms that needed to be rebuilt in 2012. Funding should be set aside to build infrastructure, but in order to see improvements over the coming years it is important to also focus on maintaining existing infrastructure. This will mean bolstering recurrent funding. Chapter 9 shows that that the national government's development budget has been given increasing priority over the last decade. This is also happening at the school level where more funding is spent on infrastructure than maintenance.

In sum, our analysis suggests that the education sector has not experienced a "lost decade". In some cases, an improvement in one area (for example, access to water) has been countered by a decline in another area (absenteeism). In other cases, positive and negative outputs are intertwined. For example, increased enrolments have put pressure on school infrastructure. But overall the last decade for education was one of expansion.

Chapter 3 Annex

Table 3-A1: Summary statistics and tests of difference for education variables, 2002 and 2012

		2002			2012			Test-
		N	mean	SE	N	mean	SE	statistic
Students								
Enrolments	no.	182	186	13.4	207	294	18.5	4.7
Share of girls in enrolments	%	187	30	0.7	195	46	1.7	8.8
Grade 5 attendance rate	%	175	84	1.2	201	71	2.1	-5.4
Grade 5 missed more than 10 days in Term 3	%	174	9	1.0	202	18	1.2	5.8
Most children in community attend school	%	204	62	3.2	212	70	4.0	1.6
Classrooms								
Number	no.	206	6.9	0.4	216	8.4	0.3	3.0
Made of permanent materials	%	206	63	2.3	216	73	2.0	3.3
Needing rebuilding	%	206	32	2.1	216	32	1.9	0.0
Needing maintenance	%	206	38	2.0	216	41	2.3	1.0
With chair & table for teacher	%	204	44	2.8	216	74	2.3	8.3
Enrolled students/functioning classroom	no.	182	38	2.6	197	53	5.8	2.3
Facilities								
Year-round drinking water	%	198	58	3.2	214	72	2.8	3.3
Enough female toilets	%	188	56	3.4	214	61	3.1	1.0
Schools with electricity	%	209	15	2.4	205	27	3.0	3.1
Infrastructure index	%	199	54	1.2	216	60	1.3	3.3
Teachers								
Positions	no.	206	7.9	0.6	215	9.6	0.7	1.8
Working	no.	205	6.5	0.7	216	8.7	0.7	2.2
Paid at grade	%	145	52	3.9	198	89	2.0	8.4
Paid allowances	%	168	35	3.5	197	34	3.1	0.0
Teacher usually on time	%	203	69	3.0	212	59	3.1	-2.3
Teacher usually teaching	%	204	69	2.4	211	65	3.0	-1.1
Students per (working) teacher	no.	181	31	1.5	207	36	1.6	2.3
Teacher housing								
Number	no.	206	5.2	0.2	216	6.8	0.4	3.5
Teacher positions per functioning house	no.	206	2.5	0.3	215	2.6	0.3	0.2
Made of permanent materials	%	206	48	1.2	216	58	2.0	4.3
Needing rebuilding	%	205	32	1.2	216	32	2.8	0.0
Needing maintenance	%	205	36	2.2	216	39	2.1	1.0
Textbooks								
Average per subject per grade	no.	161	29	1.9	194	34	2.0	1.7
Average students per textbook	no.	197	2.0	0.3	198	2.2	0.3	0.4
Sufficient textbooks	%	175	24	3.1	203	31	2.8	1.7
Accessibility								
Time to get to a bank	hrs.	197	3.9	0.4	216	5.3	0.7	1.7
Time to acquire mobile reception	hrs.	177	1.9	0.3	216	0.9	0.2	-2.8
Remoteness index	hrs.	185	3.0	0.3	214	3.5	0.4	1.0
Supervision by Standards Officer (SO)								
At least one SO visit a year	%	214	56	3.1	216	64	3.0	1.9
SO checked records	%	168	56	3.6	201	68	3.0	2.6
SO submitted report	%	171	65	3.4	216	80	2.5	3.5
SO observed classes	%	174	58	3.5	201	62	3.2	0.9
Board of Management (BoM)								
BoM meetings	no.	179	4.0	0.2	213	4.0	0.2	0.0
BoM membership	no.	206	8.8	0.2	216	8.0	0.2	-2.8
BoM effective	%	196	77	3.2	196	67	4.2	-1.8
Most say over school subsidy	%	205	48	3.2	215	67	3.0	4.3
P&C Committee								
Schools with P&C	%	207	95	1.4	216	96	1.3	0.5
P&C meetings	no.	189	3.7	0.2	199	3.9	0.3	0.6

		2002			2012			Test-
		N	mean	SE	N	mean	SE	statistic
School revenue								
Total revenue	2012 kina	139	35,031	6,972	196	87,486	6,490	5.5
Total revenue per student	2012 kina	89	159	11	188	336	21	7.5

Notes: Test-statistic is calculated as the difference in the mean between 2012 and 2002 divided by the standard error of the difference in the mean, which in turn is calculated as the square root of the sum of squared standard errors for each year. A test-statistic (in absolute value) greater than 1.65 indicates a statistically significant difference in means at the 10% significance level, and greater than 1.96 indicates a significant difference at the 5% significance level (based on a two-tailed t-test). For definitions of variables see Table 1 in the Summary. A few variables are for 2001 rather than 2002: see the notes to Table 1 in the Summary for details.

4 HEALTH CLINICS: 2002 TO 2012

4.1 Introduction

This chapter assesses the state of PNG's primary health care clinics in both 2002 and 2012 to assess progress over the last decade. The analysis covers patient visits (Section 4.2), medical supplies (Section 4.3), health worker numbers and conditions (Section 4.4), health facility infrastructure and utilities (Section 4.5), outreach and mobility (Section 4.6), user satisfaction (Section 4.7), and supervision and community engagement (Section 4.8).

The 2002 PESD survey did not cover health in as much detail as education, so we are unable to conduct comparative analysis for all these aspects. For some of the latter sections of the chapter, we only have 2012 data. As noted in Chapter 2, the number of health clinics surveyed was increased from 117 in the 2002 survey to 142 in the PEPE survey. Survey teams attempted to visit the same 117 primary health care facilities surveyed in 2002. However, many health clinics visited in 2002 were either no longer operational or closed at the time of the survey. To a lesser extent, difficulties in travelling to facility sites because key roads, bridges and airstrips had deteriorated or because of tribal fighting, prevented survey teams from visiting some PESD health facilities. All this meant that survey teams were only able to visit 63 out of the 117 health clinics surveyed under the PESD (see Table 2-6).

When only 2012 data is presented, the full sample size is used (142 health clinics). Comparisons with 2002 data have been undertaken using both the full sample and the matching sample. The same picture emerges from both. As explained in Chapter 2, this chapter uses the full sample for the comparisons over time so that results are based on a larger sample size. Unless otherwise indicated, the results draw on the interviews with the Officers in Charge (OIC). The year, if not otherwise indicated, is 2012.

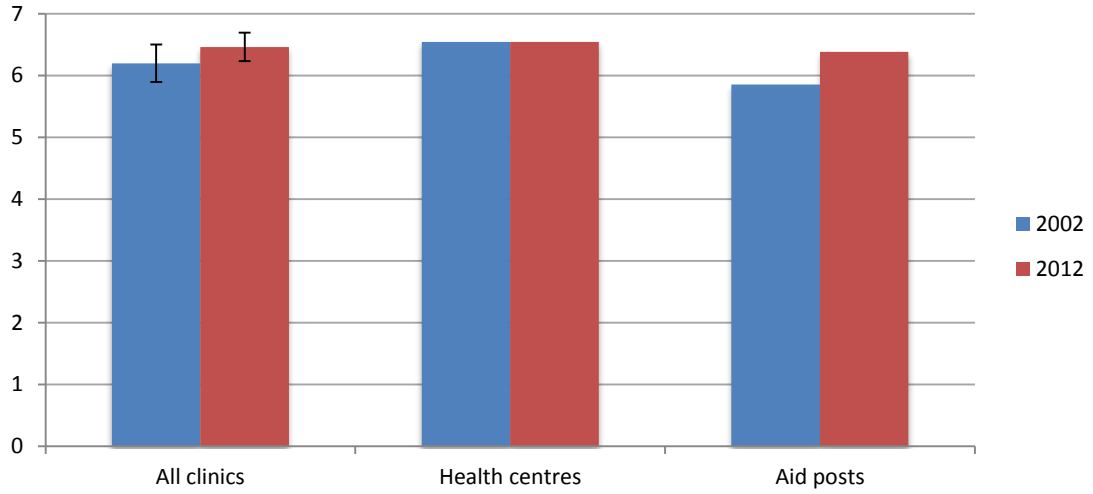
Due to the large differences between health centres and aid posts, we often show results for them separately. Health centres in fact cover sub health centres, urban clinics as well as health centres proper, and we refer to this enlarged group as 'HC+', or simply 'health centres'. The term 'health clinic' is used to cover both health centres and aid posts.

A comparison of results from the 2002 and 2012 surveys indicates health services have declined over the last decade. Health clinics struggle to provide core services due to poor operational infrastructure, a lack of basic utilities, supplies and workforce problems. There is widespread variation in health service provision across provinces, and church-run clinics outperform government clinics on a number of dimensions.

4.2 Days open and patient visits

The average number of days health clinics are open in a week increased marginally from 6.2 days in 2002 to 6.5 days in a week in 2012 (Figure 4-1). While the number of days the surveyed health centres were open remained the same, aid posts were open for half a day longer. A larger health centre in a town setting normally has specific opening hours, which may or may not include alternative arrangements for after-hours care. But survey teams encountered some aid posts, especially those operating in more remote communities, that did not have regular operating hours and instead operated more informally on a "needs basis", that is, opening when there are patients. They were open, on this basis, to treat patients every day of the week.

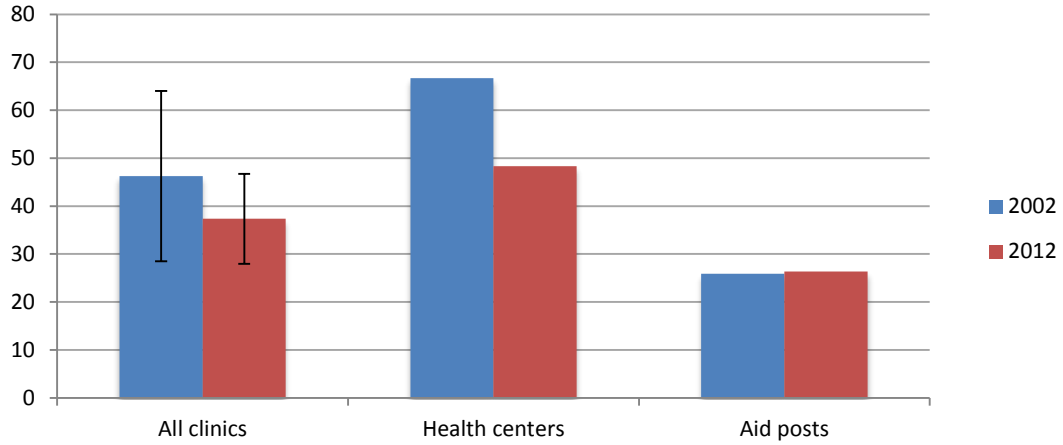
Figure 4-1: Average number of days per week health clinic open



Note: In this and the other figures in this chapter, error bars show 90 per cent confidence intervals. Numbers and t-test statistics for Figures 4-1 to 4-5 and 4-7 can be found in Annex Table 4-A1.

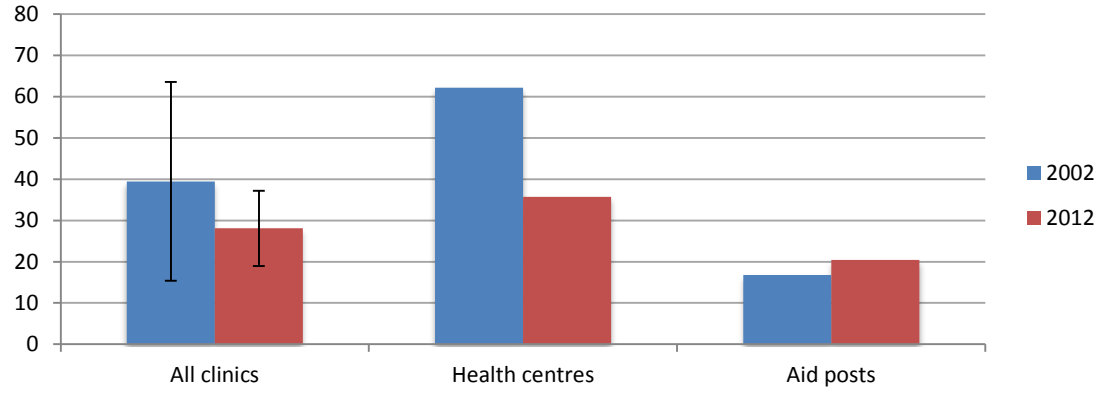
Even if some health clinics are open for slightly longer, this does not necessarily mean that more patients seek treatment. Figure 4-2 shows that an average of 37 patients visited health clinics in 2012, 19 per cent less than the 46 patient visit average in 2002. While this change is not significant at the 90 per cent level, it is certainly worrying, especially given estimated population growth of about 30 per cent. Patient visits to surveyed health centres fell by 28 per cent, while visits to aid posts slightly increased by 2 per cent.

Figure 4-2: Patient visits to health clinics in a typical day



Health clinics surveyed in 2002 and 2012 were also asked for the number of patient visits the day before the survey was carried out. Figure 4-3 indicates that patient visits "yesterday" fell from 39 visits a day in 2012 to just 28 visits in 2002. Again, while this decline is not significant, it is nevertheless of concern. It fits a pattern of reduced service delivery volume – and it is a large decline, almost 30 per cent. Health centres on average had 26 patient visits less the day before, but aid posts had close to four more.

Figure 4-3: Patient visits to health clinics "yesterday"



The decline in patient visits on the day prior to the survey is more pronounced across the 10-year period than that of patient visits on a typical day. Since the PEPE and PESD carried out survey implementation at different times of the year in 2002 and 2012, this could have influenced responses. On the other hand, responses for typical-day visits may embed more optimism.

Whichever estimate is taken – a decline of 19 per cent or of 29 per cent in patient visits – since population growth was in the vicinity of 30 per cent over the last ten years, the survey suggests that, even allowing for slightly longer opening hours, the population utilisation rate of health clinics roughly halved over this period. This rapid decline in effective patient demand for primary health care services suggests a loss of

confidence by the population in their primary health care system. Ordinary citizens are voting with their feet, and staying away.

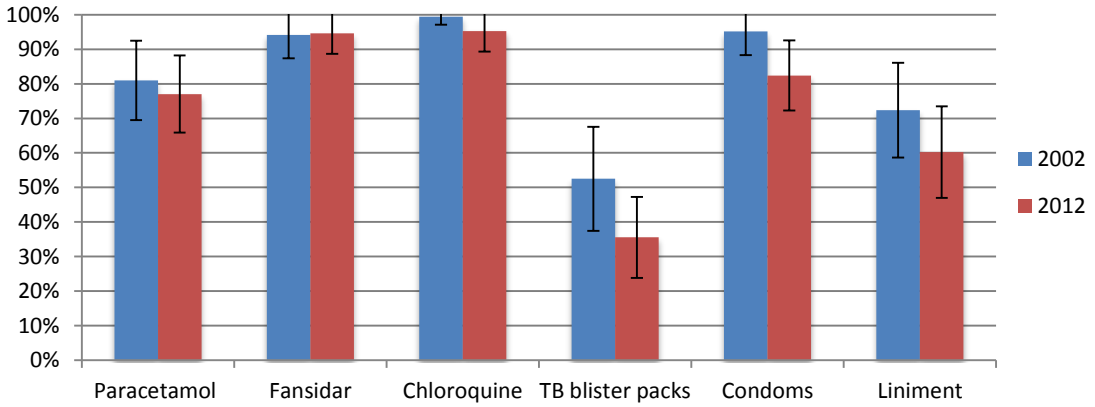
These findings are consistent with national trends of declining outpatient visits (those who do not stay overnight) collected through PNG's National Health Information System for the last few years. Based on this data, PNG's 2013 Sector Performance Annual Review (SPAR) (GoPNG 2013) estimates that the average number of health centre and hospital visits per year has fallen from 1.59 in 2008 to 1.26 per person visits in 2012. This is an 11 per cent reduction (assuming 3 per cent population growth per year) over five years.

The sample size is too small to support accurate provincial comparisons, but trends were highly variable across provinces.

4.3 The availability and cost of basic medical supplies

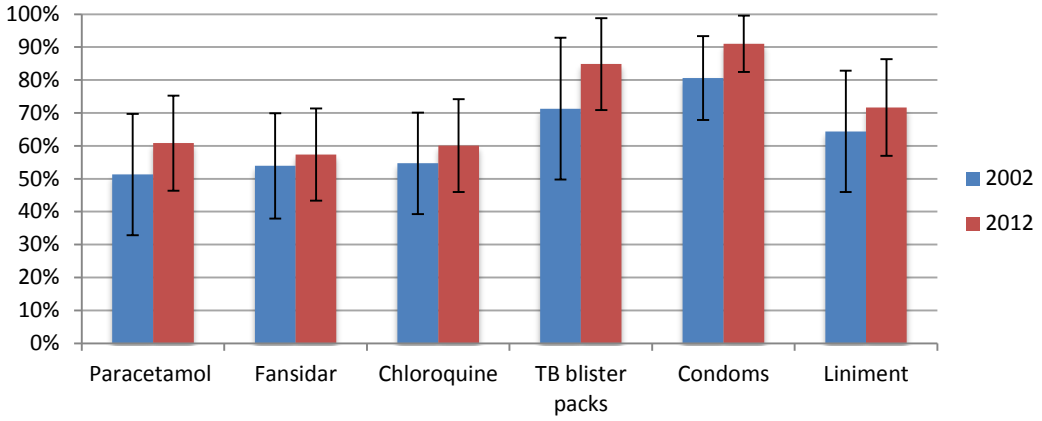
The availability of common drugs and medical supplies has declined over the last decade. Figure 4-4 shows that the availability of all but one of the six drugs and medical supplies that were asked about in both surveys has decreased. Average availability across the six drugs and supplies fell from 82 to 74 per cent. TB blister packs, condoms and liniment recorded the largest declines. Fansidar was the only drug to maintain the same availability over the decade. The declines were not statistically significant, but the fact that all but one of the changes are heading in the same direction supports the finding of reduced availability of drugs and supplies.

Figure 4-4: Availability of six drugs and medical supplies across clinics



Drugs and medical supplies were less likely to be available, but more likely to be free of charge. Figure 4-5 indicates that health clinics became less likely to charge for the six drugs and medical supplies over the ten years. (The average is only across those that had the drug or supply in stock.) In 2012, just over half the clinics did not charge for paracetamol, fansidar and chloroquine, and more did not charge for TB blister packs, condoms and liniment. The likelihood of not charging averaged over the six drugs and supplies increased from 63 to 71 per cent.

Figure 4-5: Drugs and supplies offered free of charge across clinics



Note: Average across those clinics where the drug or supply was available.

4.4 Health workers

Health worker numbers

Health workers are a core component of any primary health care system. Both surveys collected data from the Officer in Charge (OIC) on the number of health workers positions (the number that were supposed to be posted to health facilities), workers who regularly turn up, and those who were present at the time of the survey. Table 4-1 indicates that the average number of health worker clinic positions increased from 4.8 workers to 5.4 between 2002 and 2012, a statistically insignificant change. The number of health workers who regularly turn up to the facility for work remained unchanged at 4.1 on average in 2002 and 2012, which means that a smaller proportion of positions is filled. The surveyed ratio of workers regularly turning-up to positions fell from 91 to 80 per cent. The number who were actually present at the time of the survey fell from 3.4 to 3.2, or from 71 to 59 per cent as a proportion of positions.

Table 4-1: Health worker numbers at health clinics

	Health worker positions		Health workers regularly working (turning up)		Health workers present		Positions filled (%)	
	2002	2012	2002	2012	2002	2012	2002	2012
Overall	4.8	5.4	4.1	4.1	3.4	3.2	91	80
	(0.9)	(0.8)	(0.9)	(0.7)	(0.7)	(0.6)	(3.4)	(4.4)

Note: The OIC was asked how many health workers are supposed to be posted to the health facility, as each clinic has a designated number of staff. They were also asked how many regularly turn-up for work and were present at the time of the survey. The proportion of positions filled is the ratio of the two averages shown of health workers regularly turning up to health worker positions. In this and subsequent tables, the numbers in brackets are standard errors.

A World Bank (2012) report on PNG's health workforce shows a reduction in the number of nurses in the health workforce by 34 per cent between 1998 and 2009 and in community health workers by 18 per cent over the same period. These results are consistent with that, if is kept in mind that the number of health clinics, especially aid posts, has fallen over the last decade

Since the number of workers turning up is roughly constant, and the number of patients has declined, the patient-to-staff ratio has fallen as well. For example, the ratio of the average number of patients on a the day before the survey to the average number of staff present on the day of the survey falls from 11.8 in 2002 to 8.7 in 2012.

Comparisons across provinces reveal some important differences but are only possible using 2012 data due to differences in clinics visited across provinces in both surveys (Table 4-2). In Gulf, the proportion of positions filled was only 56 per cent. But in Sandaun and East New Britain it was 91 per cent. This variation across provinces may reflect different management practices of health workers. The number of patient visits on a typical day per health worker in 2012 who regularly turns up ranges from 23 visits per health worker per day in West New Britain to just 10 in the Eastern Highlands. Health workers at aid posts see an average of 22 patients per day compared to just eight for health centres.

Table 4-2: Health worker positions and attendance at clinics

	Worker positions	Workers turning up	Proportion of positions filled (%)	Patient visits per health worker
Overall	5.4	4.1	80	14.5
	(0.9)	(0.9)	(4.4)	(0.8)
East New Britain	6.9	6.1	91	9.9
West New Britain	5.4	3.8	75	23.1
Morobe	5.0	3.5	80	14.4
Sandaun	4.4	4.1	91	15.3
Eastern Highlands	4.8	3.2	75	9.7
Enga	7.6	6.1	80	10.3
Gulf	4.9	2.7	56	15.0
NCD	8.2	6.0	79	17.4
Health centres	9.0	6.9	81	8.3
Aid posts	1.5	1.1	79	22.3
Government	5.0	3.7	79	15.6
Church	6.7	5.4	79	12.6

Note: The ratios shown in the third and fourth columns are averages across clinics. The proportion of positions filled is the ratio of workers regularly turning up to positions. Patient visits per health worker is defined using visits on typical day and the number of workers turning up.

The 2012 PEPE survey gathered perceptions from health clinic users about health worker attendance. Table 4-3 indicates that half of users believe health workers spend most of their time at the clinic treating patients. 17 per cent said health workers are 'often' at the clinic, 22

per cent reported 'sometimes', while 6 per cent said 'rarely' and only one per cent said 'never'. Some provinces performed better that others. In East New Britain, Enga and Sandaun over 80 per cent of respondents said health workers were either always or often at the clinic. Eastern Highlands and Gulf did not perform as well, recording higher percentages of health workers sometimes or rarely at the clinic treating patients. Averaging across health centres and aid posts, 83 per cent of church health workers are perceived to be always or often available, but only 60 per cent of workers at government clinics.

Table 4-3: User perceptions of availability of health workers at the clinic (%)

	Always	Often	Sometimes	Rarely	Never
Overall	53	17	22	6	1
	(2.8)	(2.0)	(2.3)	(1.4)	(0.5)
East New Britain	61	19	14	6	0
West New Britain	67	5	28	0	0
Morobe	50	17	21	8	4
Sandaun	61	22	10	7	0
Eastern Highlands	47	6	34	13	0
Enga	62	29	9	0	0
Gulf	53	3	37	7	0
NCD	19	38	31	13	0
Health centres	57	15	24	4	0
Aid posts	55	15	19	8	2
Government (HC+)	43	12	36	8	0
Church (HC+)	72	18	10	0	0
Government (AP)	52	13	26	6	3
Church (AP)	50	25	4	21	0

Gender and experience of the health workforce

The position of the Officer-in-Charge (OIC) of a health facility can carry significant influence in a village or town setting in PNG. Table 4-4 shows that 43 per cent were female, up from 34 per cent in 2002. There was significant variation in the percentage of female OICs surveyed across the provinces, ranging from only 19 per cent in the Eastern Highlands to 75 per cent in NCD. Female OICs are much more likely to be in charge of a health centre (51 per cent) than an aid post (20 per cent). In 2012, a majority of (non-OIC) health workers were female. (There were no non-OIC health worker interviews in 2002).

Table 4-4: Gender composition of the health workforce (%)

	Female OICs		Female health workers
	2002	2012	2012
Overall	36	41	52
	(8.9)	(8.2)	(2.2)
East New Britain	63	67	82
West New Britain	45	62	50
Morobe	33	27	33
Sandaun	27	34	40
Eastern Highlands	22	19	37
Enga	15	48	64
Gulf	14	31	57
NCD	67	75	94
Health centres	46	44	51
Aid posts	27	38	65
Government	49	57	40
Church	29	36	73

Note: Health workers were only interviewed at clinics that had at least one health worker apart from the OIC. 82 non-OIC health workers were interviewed in 2012. None were in 2002.

The 2012 PEPE survey asked the OIC and other health workers at clinics for years spent in their position. Table 4-5 shows that OICs have been in their position for almost nine years, and other health workers for nine and a half years on average. There was some variation across provinces. In East New Britain, OICs had served at the same clinic for only four years, less than half the average, while health workers in NCD had been at the clinic for less than six years. In contrast, for both Enga and Gulf, OICs and health workers had been serving at the same clinic for over a decade on average. Those stationed at aid posts and government-run clinics were in their position for longer than those at health centres and church-run clinics, respectively. On average, health workers seem to spend much more time at the same clinic than teachers do at the same school (see Table 3-13). While more experience in one location may seem positive, health workers may simply be unable to rotate to other clinics, as teachers do between schools, because there are simply not enough health workers to take their place.

In terms of motivation to continue at the clinic, 88 per cent of OICs wanted to stay on the following year. Responses were fairly consistent across all provinces ranging from 75 to100 per cent. OICs at church-run clinics were more than 10 per cent more likely to want to stay at the clinic than those at government-run clinics.

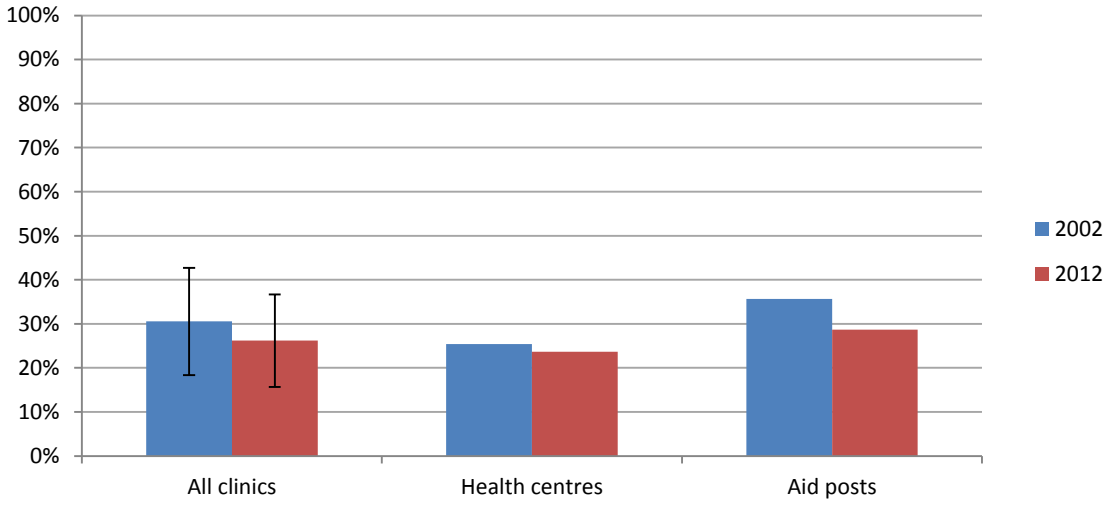
Table 4-5: Experience at clinic and desire to stay

	Years at health clinic		Wants to stay at clinic (%)
	OIC	Health Worker	OIC
Overall	8.9	10.0	88
	(0.5)	(0.5)	(1.8)
East New Britain	4.2	5.4	82
West New Britain	8.4	10.8	100
Morobe	10.2	7.2	92
Sandaun	9.6	11.0	75
Eastern Highlands	9.0	13.8	83
Enga	10.5	16.1	100
Gulf	10.4	9.8	83
NCD	7.1	5.8	93
Health centres	8.2	9.3	88
Aid posts	9.8	11.2	87
Government	8.8	10.0	83
Church	8.4	8.7	94

Health worker training

Health workers surveyed were marginally less likely to have attended in-service training in 2012 than 2002 (Figure 4-6). Considering the 2002 survey was carried out mid-year, these results indicate a deterioration in the number of health workers attending training.

Figure 4-6: Number of staff attending in-service training (2002 – 2012)



Health worker conditions

The working environment and conditions health workers operate under can influence worker morale and commitment. Unfortunately, this data was not collected in 2002, so is shown here only for 2012.

Table 4-6: Health worker pay (%)

Percentage of health workers …	Paid at official grade	Paid eligible allowances	Receive pay on time	Alternative income	Use pay to deliver services
Overall	55	30	72	34	75
	(2.6)	(2.5)	(2.5)	(2.6)	(2.4)
East New Britain	88	36	91	57	66
West New Britain	72	44	80	69	94
Morobe	28	32	71	14	79
Sandaun	53	22	76	11	90
Eastern Highlands	64	19	61	9	22
Enga	56	22	90	37	82
Gulf	42	29	37	52	90
NCD	67	44	75	19	63
Health centre	55	37	69	39	67
Aid post	50	21	82	28	83
Government (HC+)	67	34	93	35	69
Church (HC+)	42	41	72	37	64
Government (AP)	72	23	86	31	84
Church (AP)	19	29	49	32	100

Whether health workers are receiving the full pay they are entitled to has become a major issue of concern in the sector. Table 4-6 indicates that 55 per cent of health workers believed they were being paid at their official grade. East New Britain is the standout performer among provinces at 88 per cent. Morobe is at the other end with only 28 per cent. There were also large disparities between government and church health clinics, which is consistent with more general equity concerns raised by church health providers (Piel et al 2013). 67 per cent of government health workers at health centres and 72 per cent at aid posts believe they are paid at their official grade compared to only 47 per cent of health workers at church health centres and only 19 per cent for aid posts.

72 per cent of health workers reported receiving their pay on time. Most health workers directly receive their pay into a bank account so the problem is not late payment but accessing their pay from a bank, ATM or EFTPOS-type facility at a trade store. Health workers at government facilities are more likely to receive their pay on time, especially at the aid post level. 86 per cent of workers at government aid posts receive their pay on time compared to 49 per cent at church aid posts.

Health workers are usually entitled to other allowances besides their salary. This might include leave fares to return to their home, as well as allowances for conducting health outreach patrols to rural villages. However, only 30 per cent claimed to have received these payments. Church health workers are more likely to receive allowances than government workers and health centre workers access their allowances more so than CHWs at aid posts.

Overall, more than a third of health workers have an alternative source of income. There was a diverse range of responses across provinces from less than 10 per cent in the Eastern Highlands to almost 70 per cent in West New Britain. Local economic conditions can influence opportunities for health workers to earn an alternative income. For instance, the oil palm industry was cited in West New Britain. Other provinces mentioned that it was common for health workers to earn another income by selling vegetables at the market.

More health workers use their own pay to deliver services than earn an alternative income. Three quarters of health workers claimed to draw on their own salaries to meet expenses for providing health services. 90 per cent or more of health workers from more remote provinces like Gulf, Sandaun and West New Britain said they used their pay to deliver services. The willingness of health workers to use their own salaries to pay for health costs is both a cause for optimism and concern. It may be a strong indicator that health workers are committed to providing health services, even at their own expenses. However, it is also a sign that they are inadequately funded to deliver services.

4.5 Health clinic infrastructure and utilities

Health facility infrastructure and enabling utilities are essential to delivering quality health services. The poor condition of health infrastructure, mainly clinic rooms and worker housing, is well known in PNG, but there has been no reliable quantitative baseline to demonstrate the extent of the problem. This was not a topic explored in the PESD survey, but it was included in the 2012 PEPE survey.

Clinic rooms and staff housing

Table 4-7 shows that almost a quarter of clinic rooms need complete rebuilding, while 43 per cent need maintenance. In all, about two-thirds of clinic rooms need some infrastructure support. Some provinces performed better than others. In NCD, only 8 per cent of clinic rooms need rebuilding but more than half do in West New Britain.

Staff housing is almost twice as likely to need complete rebuilding as clinic rooms. In Sandaun, West New Britain and Gulf almost all housing requires either complete rebuilding or maintenance.

Infrastructure at church-run health clinics is in better condition than at government ones. 28 per cent of government aid post clinic rooms need rebuilding, compared to 14 per cent for church aid post rooms. 54 per cent of staff housing attached to government health centres need complete rebuilding compared to just 26 per cent for church health centre housing.

Providing support to clinics to maintain operational infrastructure is a key priority of the health function grant provided to provinces. Yet Table 4-7 shows that only about 30 per cent of health clinics reported

that they conducted basic maintenance of health clinic rooms or staff housing during the year. Church-run health centres, but not aid posts, significantly outperformed their government counterparts when it came to maintenance.

Table 4-7: Rebuilding and maintenance requirements (%)

Percentage of health clinics …	Carried out maintenance in 2012 of health clinic or staff housing	Where clinic rooms requires		Where health worker housing requires	
		Rebuilding	Maintenance	Rebuilding	Maintenance
Overall	32	24	43	40	37
	(2.6)	(0.3)	(0.4)	(3.1)	(2.0)
East New Britain	52	13	45	24	55
West New Britain	22	54	22	60	28
Morobe	23	33	34	18	28
Sandaun	51	18	49	43	58
Eastern Highlands	42	24	49	17	50
Enga	27	10	55	64	16
Gulf	26	27	38	43	46
NCD	13	8	26	10	60
Health centre	42	24	40	39	37
Aid post	19	22	50	46	29
Government (HC+)	29	26	42	54	26
Church (HC+)	55	21	37	26	46
Government (AP)	20	28	42	57	25
Church (AP)	22	14	43	20	57

Health clinic utilities

The availability of key utilities at health facilities such as electricity, refrigeration, toilets and water is essential. Health emergencies can occur at any time of the day, so light at the health clinic to treat patients at night or operate medical equipment is also critical. However, Table 4-8 shows that only 40 per cent of health clinics have access to electricity, 41 have refrigeration, and 51 have enough toilets. Provincial comparisons reveal highly contrasting situations. 94 per cent of health facilities in NCD have electricity, but none in West New Britain.

Health clinics with electricity and refrigeration differ significantly by type and agency. 61 per cent of health centres but only 17 per cent of aid posts have electricity. Church clinics do not always do better, but 77 per cent of church-run health centres have electricity compared to 51 per cent of government health centres.

The most common type of toilet facility was a pit latrine and there were rarely separate male and female toilets.

Table 4-8: Health clinics with electricity, refrigeration and enough toilets

Percentage of health clinics with…	Electricity	Refrigeration	Enough toilets
Overall	40	41	51
	(2.8)	(2.9)	(3.0)
East New Britain	67	71	53
West New Britain	0	25	70
Morobe	42	25	46
Sandaun	43	29	31
Eastern Highlands	56	72	61
Enga	47	44	64
Gulf	15	37	44
NCD	94	88	44
Health centres	63	71	60
Aid posts	19	13	44
Government (HC+)	51	70	61
Church (HC+)	77	72	60
Government (AP)	17	0	37
Church (AP)	8	11	52

Note: Solar-powered refrigeration means that a health clinic can have refrigeration but not electricity.

Table 4-9 indicates that 79 per cent of health clinics have a water supply, usually piped or through a rainwater tank. 70 per said that the water supply was working at the time of the survey. Only 55 per cent said the water supply was working for all of 2012. Slightly less than half of health centres reported that water was connected to the delivery room and working at the time of the survey.

Other important assets for the health clinics to provide services are access to an ambulance to transfer patients, beds with mattresses and a kitchen. Table 4-10 shows that only 20 to 25 per cent of clinics are in possession of each of these assets.

There is huge provincial variation. For example, 60 per cent of health clinics in East New Britain have access to an ambulance compared to only 3 per cent in Gulf Province.

Aid posts are particularly poorly equipped. Only 4 per cent have access to an ambulance even though an aid post is just as likely as a health centre to need to transfer patients in case of emergencies.

Church-run agencies do better on most but not of all these fronts.

Table 4-9: Health clinic water availability (%)

Percentage of health clinics with…	Access to water	Water working at time of survey	Water working all 2012	Water connected to delivery room
Overall	79	70	55	47
	(2.4)	(2.6)	(2.9)	(4.5)
East New Britain	89	85	62	31
West New Britain	64	64	38	39
Morobe	79	61	39	33
Sandaun	79	79	68	78
Eastern Highlands	83	83	47	28
Enga	73	48	48	69
Gulf	68	65	50	40
NCD	94	81	81	56
Health centres	82	76	55	46
Aid posts	76	66	48	NA
Government (HC+)	82	71	49	48
Church (HC+)	82	82	58	44
Government (AP)	68	61	45	NA
Church (AP)	84	59	37	NA

Note: Figures in final column 'connected to delivery room' only reports results for health centres because it is not common for aid posts to have a delivery room.

Table 4-10: Good and adequate access to an ambulance, beds and kitchen (%)

Percentage of health clinics with…	Access to ambulance (good or adequate)	Beds with mattresses (good or adequate)	Kitchen (good or adequate)
Overall	23	20	23
	(2.7)	(2.4)	(2.7)
East New Britain	59	35	39
West New Britain	17	17	66
Morobe	17	17	8
Sandaun	18	18	16
Eastern Highlands	19	8	0
Enga	32	30	23
Gulf	3	19	03
NCD	25	38	38
Health centres	40	35	30
Aid post	4	03	09
Government (HC+)	35	31	29
Church (HC+)	45	38	32
Government (AP)	35	31	11
Church (AP)	45	38	7

4.6 Health service outreach, mobility and basic service delivery

In a setting such as PNG, to be effective health centres need to be mobile. They need to run patrols, transfer patients, and pick up drugs. This section explores these aspects of performance. It is limited to 2012 data.

Conducting health outreach patrols to villages that do not have health clinics should be the backbone of providing effective rural primary health care. The large majority of PNG's population lives in rural and remote settings and have to either walk long distances to health facilities or wait for outreach patrols to come to them. Health function grants should be an important funding source for health clinics to draw on to provide this service.

Table 4-11 reveals extensive variation in the number of health patrols conducted across provinces. While the average number of patrols conducted was almost 12 per health centre in 2012, East New Britain recorded more than 38 patrols on average while West New Britain averages more than 22 patrols. In more remote and rural provinces, such as Sandaun and Gulf, where patrols are especially important, health centres conducted less than two patrols on average in 2012. This is a very low figure, and indicative of a general breakdown in the system of providing outreach services.

Table 4-11: Health clinic outreach and mobility

	Total number of patrols conducted in 2012	Health clinics conducting more than 5 patrols (%)	Health clinics can transfer patients (always & most) (%)	Health clinics have access to fuel (always & most) (%)
Overall	9.3	18	33	36
	(5.2)	(2.2)	(4.7)	(4.9)
East New Britain	45.5	46	23	44
West New Britain	14.1	25	20	80
Morobe	1.7	13	67	50
Sandaun	1.5	0	25	12
Eastern Highlands	3.8	19	25	11
Enga	5.0	31	23	20
Gulf	1.4	3	12	9
NCD	1.2	6	50	50
Health centres	11.9	27	45	47
Aid posts	1.5	7	20	22
Government (HC+)	9.6	28	45	53
Church (HC+)	14.6	26	57	45
Government (AP)	1.4	2	13	6
Church (AP)	0.9	8	14	32

The total number of patrols can be a misleading indicator as health centres face different types of geographies in reaching populations with varying degrees of remoteness. To better understand if health clinics regularly conduct patrols, a more appropriate measure is to assess the percentage of health centres that conduct at least five patrols. This number would likely be the absolute minimum for health centres that claim to conduct patrols with some regularity. Table 4-11 shows that only 27 per cent of health centres conducted more than five patrols in 2012.

Fuel for transport so that health clinics can collect and deliver drugs is essential. (Based on survey data, close to 90 per cent of health clinics order drugs. Responsibility for collection usually lies with the clinic itself.) Table 4-11 shows that only 36 per cent of health clinics have good access to fuel to support medical supply collection and distribution.[12]

Patient transfers to a referral health facility are another important service. The ability of the health clinics to provide such a service is dependent on an ambulance, which as previously discussed, is often unavailable for most. One third of health clinics said they were able to transfer patients all or most of the time to their referral health facility.

There is again significant variation across provinces. For example, 46 per cent of health clinics in East New Britain conducted regular patrols (at least 5 a year) but none did in Sandaun and only 3 per cent in Gulf Province.

4.7 Patient satisfaction

The 2012 survey asked users of the health facility about their satisfaction with services provided. 45 per cent said the services provided were 'very good', 22 per cent thought they were 'adequate', 20 per cent said they were 'average' and 13 per cent believed services provided were 'poor' (Table 4-12). NCD recorded the highest satisfaction levels with 75 per cent describing the service as very good, and only six per cent as poor. The Eastern Highlands easily recorded the lowest satisfaction levels with 23 per cent believing the service was very good and 28 per cent saying the services provided were poor. Users of church–run health clinics seemed more satisfied than government clinics, at least for health centres.

Overall, patient satisfaction with services provided is higher than expected given the poor state of PNG's health system outlined in this chapter. However, there is much debate in the international literature about how satisfaction is measured against patient experience with health care provided (see Bleich et al 2009). Very high levels of patient satisfaction have also been recorded in a number of developing countries, and may be explained by low expectations.

12. The fuel question asked whether clinics had access to fuel to pick up medical supplies.

Table 4-12: User community satisfaction with services provided (%)

Percentage of users thinking services provided…	Very good	Adequate	Average	Poor
Overall	45	22	20	13
	(2.7)	(2.5)	(2.3)	(1.9)
East New Britain	55	15	24	6
West New Britain	5	54	26	15
Morobe	42	17	38	04
Sandaun	50	15	11	23
Eastern Highlands	23	49	00	28
Enga	59	18	18	6
Gulf	42	13	26	19
NCD	75	6	13	6
Health centres	43	31	19	6
Aid posts	33	22	23	22
Government (HC+)	38	35	14	12
Church (HC+)	50	27	24	0
Government (AP)	30	21	20	28
Church (AP)	22	18	47	12

4.8 Supervision and community engagement

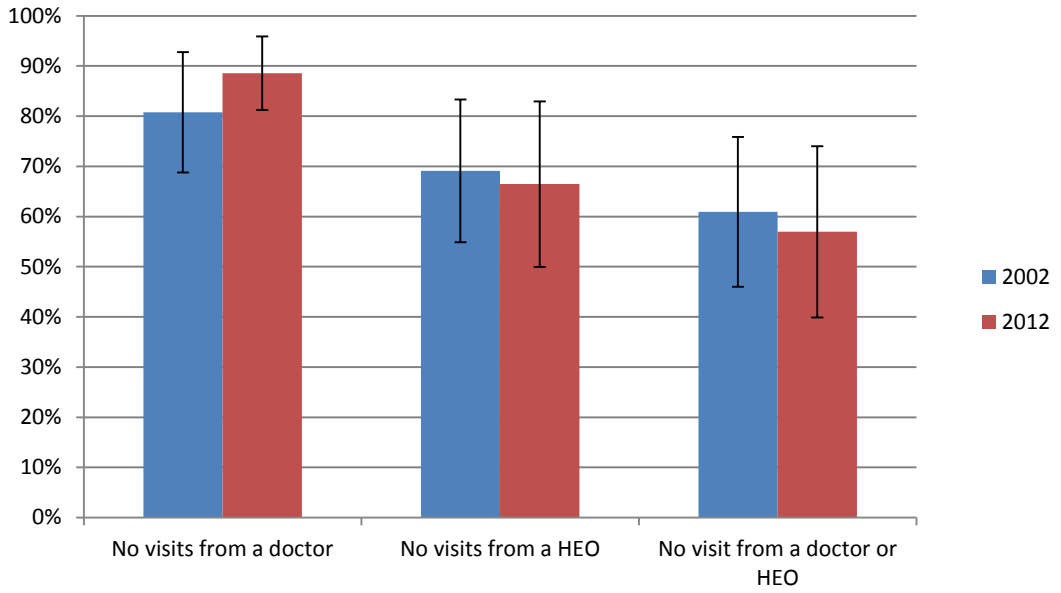
Effective supervision and support for health workers to deliver services to communities is crucial to providing comprehensive health care. So too is community engagement, as an engaged community is more likely to demand high standards of care.

Supervisory visits

Supervision and assistance for health workers can be both clinical and administrative. On the clinical side, an important aspect of PNG's primary health care system is for health facilities to receive visits from doctors or from Health Extension Officers (HEOs), sometimes called rural doctors.

The majority of primary health care clinics surveyed in the PEPE and PESD surveys did not have a doctor or HEO visit them. Figure 4-7 shows that health clinics that did not receive a doctor visit increased from 81 per cent in 2002 to 89 per cent in 2012, but the proportion that did not receive a visit from an HEO was slightly higher in 2002 than 2012. Those clinics that did not receive a visit from a doctor or HEO was 61 per cent in 2002 and 57 per cent in 2012.

Figure 4-7: Percentage of health clinics with no doctor or HEO visit



All health clinics should also receive regular administrative supervisory visits from either church or government affiliated health officials or their referral health facility. In most cases, government health centres are supervised by the district or provincial health office. Church-run health centres are supervised by their affiliated funding providers (Catholic, Lutheran, etc.). For aid posts, supervision is usually provided by the supervising health centre.

Table 4-13 (based on the full 2012 sample) shows that only 64 per cent of health clinics said that they had a supervisor. The proportion ranged from as high as 89 per cent in Enga to as low as 22 per cent in West New Britain. The average number of visits for health clinics that had a supervisor was 1.5 in 2012. NCD had more than nine visits on average, whereas health clinics in Sandaun and the Eastern Highlands recorded averages of less than one visit each for the year. Only 63 per cent of health clinics with a supervisor received at least one supervisory visit in 2012. More health centres have a supervisor and receive visits than aid posts. While more government health clinics claimed to have a supervisor, they were less likely to receive a visit than church-run health clinics. Overall, 60 per cent of clinics did not receive a visit from a supervisor in 2012. These findings indicate supervision of health clinics is generally weak.

Table 4-13: The extent of health clinic administrative supervision

	Clinics with supervisor (%)	If supervisor, number of visits	If supervisor, clinics with at least one visit (%)	Clinics receiving no visits from supervisor (%)
Overall	64	1.5	63	60
	(2.8)	(0.2)	(4.0)	(2.7)
East New Britain	74	1.5	65	52
West New Britain	22	1.3	100	78
Morobe	57	1.2	76	58
Sandaun	72	0.4	18	80
Eastern Highlands	81	0.9	50	60
Enga	89	3.0	83	26
Gulf	62	2.2	44	72
NCD	63	9.1	87	45
Health centre	72	1.9	69	50
Aid post	53	1.1	49	74
Government (HC+)	80	2.4	44	65
Church (HC+)	64	1.6	81	48
Government (AP)	62	1.6	67	58
Church (AP)	52	1.3	64	66

Community engagement

The established institution for community engagement with health clinics is the Village Health Committee (VHC). This was a topic for the 2012, but not the 2002, survey. Table 4-6 shows that 64 per cent of health clinics were supported by a VHC. Aid posts were more likely to have an operational VHC than health centres (71 versus 56 per cent). As the name suggests, VHCs are normally located in a rural village setting where community members come together on a voluntary basis either to support the health facility or represent the health needs of the community. Health centres, especially larger facilities situated in towns or stations (administrative centres), are less likely to have operational VHCs.

More rural and remote provinces surveyed generally convened more VHC meetings. While the average number of VHC meetings was just over two per year, Gulf and Sandaun averaged over three. More remote communities may have fewer choices and thus greater incentive to support the operations of the health facilities that serve them.

Survey results also provide a better understanding of how communities interact with the health facility and its workers. Table 4-14 shows that 58 per cent of OICs believe the community assists the health facility. The more rural provinces of West New Britain and Sandaun were more likely to receive support from the community and conduct promotion activities, which may suggest a correlation with the functional VHC. Almost three quarters of health facilities conduct promotion activities

in the community. At the other end of the results spectrum, in the Eastern Highlands Province, only 28 per cent of the community assists the facility, well below the average. In Morobe, less than half of its health facilities conducted promotion activities and only 39 per cent of the community assists the health facility. These results suggest there are widespread differences in how health clinics and workers interact with the community across PNG.

Table 4-14: Village Health Committees and community interaction

	Clinics with VHC (%)	If VHC, number of meetings in 2012	% health workers conduct promotion activity	% community assists health clinic
Overall	64	2.2	72	58
	(2.7)	(0.3)	(2.7)	(2.9)
East New Britain	67	2.1	89	59
West New Britain	89	2.5	100	77
Morobe	62	1.1	49	39
Sandaun	71	3.2	74	89
Eastern Highlands	47	2.5	58	28
Enga	58	1.8	82	61
Gulf	56	3.4	68	59
NCD	13	1.0	80	56
Health centre	56	1.8	75	53
Aid post	71	3.3	68	55
Government (HC+)	54	1.7	78	48
Church (HC+)	59	1.9	69	57
Government (AP)	77	2.4	66	58
Church (AP)	55	2.5	58	38

4.9 Conclusion

While the two health surveys offer limited comparisons over the 10-year period compared to education, the results are revealing. Clinics may be open for longer but patients visiting them have declined when measured by patient visits on either a typical day or yesterday. The decline in effective demand for primary health care could be greater than the survey results suggest. The majority of health managers in surveyed provinces believed the number of open clinics has likely declined over the period 2002 – 2012, especially in rural areas, where the majority of PNG's population lives. This would also be consistent with our survey experience.

For the six drugs and medical supplies asked about in both surveys, all were less likely to be available, but more clinics offered them to patients free of charge than a decade earlier.

The number of health workers posted to clinics has increased, but the number that regularly turn up to work at the clinic is unchanged between 2002 and 2012.

While none of the changes observed over the last decade were

statistically significant, the fact that they all went in the same direction, and that they are in some cases supported by other data sources, suggest that they are indicative of an underlying trend of deteriorating performance. Absolute falls in patient utilisation are especially worrying in the context of rapid population growth.

Declining drug availability may be one reason for reduced effective demand for PNG primary health care services. In addition, the conditions provided to health workers are not conducive for a motivated workforce. The majority do not receive annual training, only 30 per cent are paid their eligible allowances and just over half are paid at their official grade.

Health clinic infrastructure and utilities are in poor condition. Almost a quarter of clinic rooms and 40 per cent of workers' houses need complete rebuilding. Less than a third of clinics conducted maintenance in 2012. Only 40 per cent of health clinics have access to electricity and refrigeration and just over half had enough toilets. Less than half have year-round access to water supply. Less than a quarter have adequate access to an ambulance, beds with mattresses and a kitchen.

Only 18 per cent of clinics (27 per cent for health centres) are able to conduct regular outreach patrols, while about a third could regularly transfer patients and had access to fuel to conduct their operations.

Both clinical and administrative oversight of clinics require significant improvement. Only 40 per cent of clinics received at least one visit from their supervisor, which indicates a major breakdown of administrative support for clinics. Community engagement with the health clinic was limited. Only two-thirds of health clinics have a VHC, and VHCs on average only meet twice a year.

Given the clear weaknesses in the health system, patient satisfaction was higher than expected with 67 per cent of users believing services provided were at least adequate. Such high satisfaction levels are also found in a number of other countries, and may be explained by low expectations.

Overall, the survey findings suggest PNG primary health care clinics struggle to remain operational and deliver basic services. There is, however, significant variation across provinces. The range in performance across provinces shows that sub-national authorities matter in how they manage the health system. Better performers, such as East New Britain, show that health services can be delivered and the system made to work better. This is discussed further in the conclusion to Chapter 6.

Church health clinics also perform better than government ones across a number of important measures, especially in comparisons at the health centre level. Church health centres are far more likely to conduct maintenance (55 vs 29 per cent), have fewer staff houses that

require complete rebuilding (26 vs 54 per cent), are more likely to have an ambulance (45 vs 35 per cent) and transfer patients (57 vs 45 per cent) than government-run clinics. Users of church health centres are more likely to think that health workers are always available at the clinic (72 vs 37 per cent) and that the services being provided are very good (50 vs 38 per cent). The differences between church-run and government clinics are less obvious at the aid post level. Chapter 8 further explores these differences using regression analysis.

Chapter 4 Annex

Table 4-A1: Summary statistics and tests of difference for health variables, 2002 and 2012.

		2002			2012			Test-statistic
		N	Mean	SE	N	Mean	SE	
Days open and patients visit								
Days open per week	days	117	6.2	0.2	142	6.5	0.1	1.3
Patient visits typical day	no.	117	46.3	10.8	142	37.3	5.7	-0.7
Patient visits yesterday	no.	103	39.5	14.6	138	28.1	5.6	-0.7
Availability of basic drugs and supplies								
Paracetamol	% clinics	117	81	7	142	77	6.8	-0.4
Fansidar	% clinics	117	94	4.1	142	95	3.6	0.2
Chloroquine	% clinics	117	99	1.4	142	95	3.6	-1.0
TB packs	% clinics	117	52	9.1	142	36	7.1	-1.4
Condoms	% clinics	117	95	4.1	142	82	6.2	-1.7
Liniment	% clinics	117	72	8.3	142	60	8.1	-1.0
Drugs/supplies free of charge								
Paracetamol	% clinics	78	51	11.2	116	61	8.8	0.7
Fansidar	% clinics	94	54	9.7	135	57	8.6	0.2
Chloroquine	% clinics	99	55	9.4	133	60	8.6	0.4
TB packs	% clinics	51	71	13.1	60	85	8.5	0.9
Condoms	% clinics	93	81	7.7	117	91	5.2	1.1
Liniment	% clinics	69	64	11.1	89	72	8.9	0.6
Health workers								
Health worker positions	no.	117	4.8	0.9	141	5.4	0.8	0.5
Health workers turning up	no.	117	4.1	0.9	141	4.1	0.7	0.0
Health workers present	no.	117	3.4	0.7	141	3.2	0.6	-0.2
Supervision								
No visit from a Health Extension Officer	%	117	69	8.7	142	66	10	-0.2
No visit from a supervising doctor	%	117	89	7.3	142	81	8.1	-0.7

Notes: Test-statistic is calculated as the difference in the mean between 2012 and 2002 divided by the standard error of the difference in the mean, which in turn is calculated as the square root of the sum of squared standard errors for each year. A test-statistic (in absolute value) greater than 1.65 indicates a statistically significant difference in means at the 10% significance level, and greater than 1.96 indicates a significant difference at the 5% significance level (based on a two-tailed t-test). Drugs/supplies free of charge are calculated only for clinics where the drug/supply is available.

PART THREE:
FINANCING AND REFORMS

5 EDUCATION FINANCING AND THE TUITION FEE-FREE POLICY

5.1 Introduction

In 2012 the PNG Government introduced the Tuition Fee-Free (TFF) policy, which effectively eliminated tuition fees for students in elementary school up to Grade 10. The policy put into action the PNG Government's Universal Basic Education (UBE) plan (2010–2019), which aims to ensure that "all school-aged children have equal access to quality basic education in order to contribute to the development of the country" (National Department of Education [NDoE] 2009, p. i). To achieve this aim the government has allocated significantly more resources for the education sector to improve school attendance. In its first year of operation, the government allocated a total of 602 million kina – around one-third of the education budget appropriation (of 1,631 million kina) – to be distributed to schools in lieu of revenue from parents. In 2013 the total government subsidy was budgeted at 677 million kina – this included the full subsidisation of upper secondary. The subsidy is expected to increase at around 3.5 per cent per annum to 782 million kina in 2017 (NEFC & NDoE 2013).

The government has not only eliminated fees for students up to Grade 10. Under its Tuition Subsidy policy, which was also introduced in 2012, it also subsidised 75 per cent of tuition fees at the secondary and vocational school levels. Flexible, open and distance education providers are given a one-off payment of 75 kina per student. Table 5-1 outlines how the new policies allocate subsidies on a per student basis. It is important to note that the policy only covers *tuition* fees; parents are still responsible for paying project fees to schools and other school-related costs such as lunches, school uniforms and transport.

Given that PEPE and PESD surveyed primary schools, this chapter focuses on the TFF policy only, and not the Tuition Subsidy policy.

Table 5-1: Tuition fees under the TFF and Tuition Subsidy policy (kina per child)

School level	Maximum fee limits (per child)	Government contribution	Parental contribution
Elementary P1, E1, E2	100	100	0
Primary grades 3 to 8	270	270	0
Lower secondary (day)	900	900	0
Lower secondary (boarding)	1,500	1,500	0
Vocational (day)	900	675	225
Vocational (boarding)	1,300	975	325
Upper secondary (day)	990	743	247
Upper secondary (boarding)	1,500	1,125	375
Flexible/Open/Distance (one-off payment)	100	75	25

Adapted from: NDoE (2012a).

The TFF reform changes the way that subsidies are paid to schools. Previously, subsidies had been made available through the provinces. But in 2012 funds were electronically transferred directly to individual school bank accounts. This meant that many schools had to open bank accounts and register these with the department in order to receive the subsidy. The new policy required that school management – the Head Teacher and the Board of Management – consult with parents to determine the best use of the funds; the subsidy is also subject to formal monitoring by national, provincial and district level education officials.

There has been a great deal of debate about the impact of the TFF policy. The media in PNG is awash with stories about its implementation and effectiveness, but there has been little independent evaluation. This chapter draws on the results of the PESD and PEPE surveys and compares them to some of the TFF's key policy objectives. In doing so, it highlights some of the key challenges facing the TFF, and makes some suggestions on how they might be overcome.

We examine the effectiveness of the TFF policy at two levels. First, we ask how, and how well, the expanded system of payments to schools is being implemented. Are schools receiving the money in a timely manner? How much does it cost them to access it? How is it being managed? What are they using it for? Who is making the decisions?

Second, we look at whether the new policy is achieving its objectives. The Fee-Free Tuition Policy Management Manual (NDoE 2012a) states that the TFF policy supports the achievement of five key result areas of the UBE plan:

1. Access is improved for all children, especially for girls;
2. Retention is enhanced where more children complete nine years of primary education;
3. Quality of education is improved for all grades of elementary and primary levels;
4. Education management is strengthened across all administrative levels; and
5. Equity is enhanced to ensure quality education is available for all children in all communities across the country.

This chapter analyses the success of the TFF policy with respect to the result areas we are able to comment on based on the PESD and PEPE surveys (with additional data provided by the NDoE). In particular, we examine the policy's impact on access, quality of education and equity (the first, third and fifth points above).

Unless otherwise indicated, the data presented in this chapter is based on the PEPE Head Teacher survey which has a sample size of 216.

The next section provides a brief background on attempts to implement free education policies in PNG over the past decade. Section 5.3 presents the findings of our study in relation to the implementation of the TFF policy. Section 5.4 asks whether the policy is achieving its aims as set out in the 2012 TFF policy, and the final section concludes by discussing what these results might mean for further education reform in PNG.

In summary, the chapter finds that most schools are receiving the subsidy in full, and that it has been associated with a significant increase in school enrolments, similar to that achieved by the country's last attempt at free education in 2002. The increase is testament to the extent to which the policy is reducing the cost constraint on parents sending their children to primary school. However, the increase in student numbers has put strain on school resources. The chapter suggests that the subsidies could be better targeted and that more could be done to improve quality indicators and school oversight.

5.2 2002 to 2012: From free-to-fee-to-free

The decade from 2002 to 2012 has been marked by significant shifts in tuition fee policy. Late in 2001, the Morauta government announced that it would more than double school subsidies, which increased to around 150 million kina in 2002. In 2002 there was some confusion about which fees this subsidy would eliminate, but most provinces eliminated tuition fees while keeping project fees (World Bank & National Research Institute 2004). With the Somare coalition winning the 2002 election on a platform opposed to "free education" (as it was described at the time), the subsidy was significantly scaled back. Somare's government reverted the school subsidy to 2001 levels; the 150 million kina subsidy was reduced to 60 million kina (World Bank & NRI 2004, p. 46). The subsidy was also redirected away from reducing or eliminating school fees; instead the government decreed that it was only to be spent on school infrastructure and maintenance.

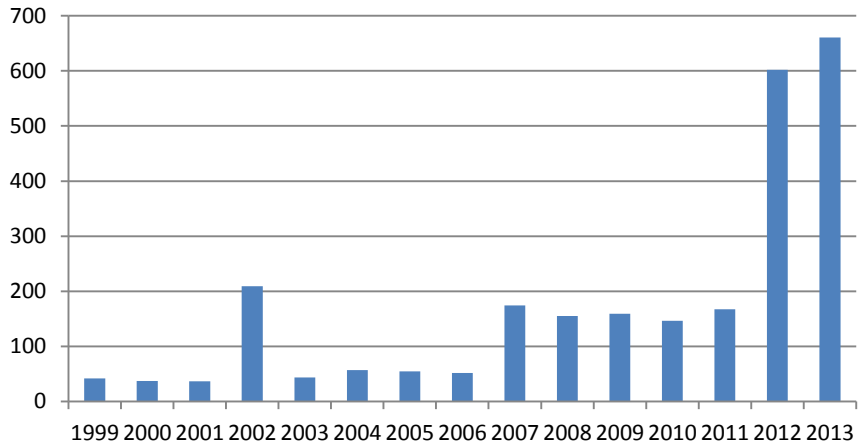
For most of the past decade, politicians and bureaucrats have been cautious about tuition fee-free and related enrolment policies. This caution was reflected in the 2004 National Education Plan, which had the rather modest aim of ensuring every 6-year-old be admitted to elementary school by 2012 and complete three years of basic education (NDoE 2004, p. 24). Universal primary education (the first nine years of schooling) was still a stated goal, but the report acknowledged that

ensuring children have access to free and compulsory education by 2015, a key goal of the 1990 Jomtien (Thailand) Declaration to which PNG is a signatory, was unlikely in the "current economic climate" (NDoE 2004, p. 6). It suggested there would be "space available" for children up to Grade 8, while the growth of enrolments in secondary college would be reduced.

With PNG's economy performing well through the 2008 global financial crisis and growing optimism around the country's future growth potential related to the LNG project, the UBE plan 2010–2019 (NDoE 2009) was more sanguine in its outlook. It aimed to have all children of school age complete nine years of education. To achieve this goal, the plan aimed for the gradual elimination of primary school fees (up to Grade 8) by 2019. By employing a gradualist approach, the NDoE hoped to monitor demand, so that resource requirements could be adjusted accordingly.

In 2007 education subsidies were increased from just over 40 million kina to about 150 million kina. They stabilised between 140 to 145 million kina until 2012. Figure 5-1 shows the rise in subsidy payments in real terms (adjusted for inflation). The graph highlights the huge rise in subsidies in 2002, and subsequent fall until they were raised again in 2007. From 2007 to 2011 funding in real terms remained constant until the subsidy allocation skyrocketed in 2012 and further increased in 2013.

Figure 5-1: Subsidy payments from the central government (2012 prices, million kina)



Source: PNG national budget documents. CPI used to deflate series.

The large jump in revenue in 2012 was unexpected. The NDoE expected a steady rise in subsidy payments, but projected far lower subsidies than exist under the TFF. In 2012, for example, it was expected that primary students would be subsidised by 177.70 kina per student (NDoE 2009), but in fact the 2012 TFF subsidy was 270 kina per student. The NDoE's UBE plan estimated that a total of 182 million kina would be spent on subsidies in 2012 (NDoE 2009). This is

less than a third of the 602 million kina budgeted for 2012 TFF subsidies.

This mismatch between planned and actual expenditure in 2012 is an outcome of the "big bang" approach to the TFF policy. The gradual introduction of tuition fee-free education was derailed in late 2011 when Peter O'Neill took over from Michael Somare as prime minister. In his first address to parliament in his new role, O'Neill stated that the government would introduce tuition free education up to Grade 10 and provide subsidised education from Grade 11 to tertiary level (Post Courier 2011). In January 2012, the NDoE circulated ministerial policy statements outlining how the subsidies would be administered and structured (NDoE 2012a). The Department, subnational governments, schools and their communities had little time to plan for the changes that were to come.

There are pros and cons of a big bang approach. On the positive side, such an approach means that all children who have yet to benefit from primary education have an opportunity to enrol. But the big bang approach has many downsides, as highlighted by the World Bank's (2009) review of experiences of abolishing school fees in Ethiopia, Ghana, Kenya, Malawi and Mozambique. This review suggests that fee-free policies that are phased in give:

> more time to mobilize required teachers, classrooms, and training materials, test different procedures for channelling the fee-replacement funds to schools, put in place transparent mechanisms for managing these funds, and mobilize the financing (pp. 24-25).

In short, the review suggests that a big bang approach can cause "access shock", whereby a sudden rise in student numbers puts pressure on educational quality.

The TFF policy's big bang approach enabled thousands of children who were previously unable to attend school the means to access an education. The rise in enrolments, however, has likely put a strain on the quality of schooling. While many speculate about these quality impacts, little is known about them and how they affect the goals of the TFF policy and other key education policies. By presenting key findings from surveys undertaken in 2002 and 2012, the following two sections highlights some of the impacts of the TFF policy, and shows where key challenges might lie.

5.3 How well is the TFF policy being implemented?

This section looks at how well the TFF is being implemented in terms of delivery and management of the subsidy. It examines whether schools are benefitting from the subsidy, how and when they receive payments and how well payments are managed.

Are schools benefitting from the TFF payments?

In Chapter 3 we showed that revenues per student increased significantly over the decade. Table 5-2 provides estimates for 2011 and 2012. Between these two years, the TFF saw national government subsidies increase from 177 to 249 kina per student, 21 kina short of the K270 per enrolled student that these schools are meant to get. (The shortfall is likely due to the fact that about 16 per cent of the schools we surveyed had not received their second payment, and 10 per cent had not received a payment at all.) Also in 2012, there was a reduction of support from provincial governments (perhaps because of the increase from the central government) and from parents (due to the TFF policy). As a result the *total revenue* per student was 336 kina per student in 2012, almost identical to the 340 reported for 2011.

In practice, it is likely that the better-organized schools that were able to produce financial statements for 2011 were also among the better off. This would mean that the figures in Table 5-2 would underestimate the increase in school revenues between 2011 and 2012. In any case, our estimate for the increase in funding from 2001 to 2012 is from K159 to K336 per student (Table 3-21). So there is no doubt that school funding has increased greatly in recent times. The key point to take away from Table 5-2 is the small size of the loss in fee revenue, only K40 per student. From this perspective, the school subsidy payment of K270 per student is generous.

Table 5-2: Revenues per student 2011 and 2012 in 2012 prices

Source of revenue	2011 (K)	2012 (K)	Growth
Parents	52	12	-76%
	(5)	(1)	
National government	177	249	41%
	(15)	(9)	
Provincial governments	32	7	-79%
	(11)	(2)	
Other (donors, church, other government, etc.)	79	68	-14%
	(2)	(19)	
Total	340	336	-1%
	(33)	(21)	

Notes: The data are measured in 2012 kina. Standard errors are in parentheses, as they are throughout this chapter. Revenue per student is calculated as the ratio of revenue to enrolled students within each school.

How are schools receiving the TFF payments?

The TFF policy reform resulted in more schools having their subsidy paid into a bank account. In 2011 under half of the schools we visited received the subsidy by bank transfer; almost 80 per cent received funding in this way by 2012 (Table 5-3). Given that receiving funding by cheque is more costly for schools than bank transfer (Table 5-4), this is a welcome development.

The NDoE aimed for all schools to be paid directly into a bank account in 2012. Our findings suggest there is still some way to go before this goal is achieved: in the first quarter of 2012 there were still 23 per cent

of schools that reported receiving their subsidy payment by cheque.[13] (Table 5-3). A similar percentage of schools received payment via cheque for their second payment. Enga was most reliant on cheques for both payments. We have been assured by the Department that far fewer schools now receive their subsidy payments by cheque than when our survey was conducted in 2012. So we expect that these figures have improved over the last two years.

Table 5-3: Type of payment for subsidy, 2011 and 2012 (%)

	2011				2012			
	First payment		Second payment		First payment		Second payment	
	Bank transfer	Cheque	Bank transfer	Cheque	Bank transfer	Cheque	Bank transfer	Cheque
Overall	44	56	45	55	77	23	79	21
	(3.4)	(3.4)	(3.8)	(3.8)	(2.8)	(2.8)	(3.2)	(3.2)
East New Britain	45	55	42	58	95	5	100	0
West New Britain	40	60	51	49	89	11	90	10
Morobe	49	51	52	48	82	18	87	13
Sandaun	53	47	49	51	80	20	81	19
Eastern Highlands	53	47	52	48	63	37	60	40
Enga	24	76	19	81	40	60	29	71
Gulf	33	67	33	67	83	17	100	0
NCD	35	65	57	43	79	21	78	22
Government	43	57	44	56	79	21	81	19
Church	49	51	52	48	75	25	79	21
Readily accessible	41	59	48	52	80	20	80	20
Accessible	37	63	32	68	69	31	64	36
Remote	61	39	63	37	91	9	96	4
Very remote	53	47	54	46	84	16	94	6

While more schools had more direct access to their subsidy payments, schools still faced substantial costs to access funds. Table 5-4 shows that, on average, it cost more than 1,000 kina to access a subsidy payment and took around 32 hours of travel. This represented almost 4 per cent of one subsidy payment (calculated as an average of both payments). In 2012, costs and travel time were particularly onerous in Gulf, Sandaun and Morobe, in part due to their remoteness. Gulf lost 32 per cent of its subsidy payments in travelling to access them. Government schools and those in remote locations also paid more to access funds.

Table 5-4 also highlights the time and cost savings involved in accessing funds through a bank. On average, schools receiving their subsidy by bank transfer travelled 41 fewer hours and saved 763 kina when accessing their funds. This suggests that banks are more accessible than subnational government offices, which usually distribute cheques.

13. These findings were backed up by BoM members who participated in our survey: 25 per cent said that the school was paid by cheque in the first quarter.

Table 5-4: Cost and time of accessing subsidy payments in 2012

	Time in 2012 (hours)	Cost (kina)	Average subsidy received (kina)	Cost as % of subsidy
Overall	32	1,132	31,251	3.6
East New Britain	30	270	30,722	0.9
West New Britain	12	1,215	29,754	4.1
Morobe	48	955	22,102	4.3
Sandaun	56	2,917	22,290	13.1
Eastern Highlands	2	45	32,504	0.1
Enga	10	822	56,547	1.5
Gulf	83	2,865	8,903	32.2
NCD	2	31	121,354	0.0
Government	37	1,164	32,436	3.6
Church	28	849	29,345	2.9
Readily accessible	11	195	60,454	0.3
Accessible	22	877	34,564	2.5
Remote	20	913	20,822	4.4
Very remote	62	2,034	16,022	12.7
Bank transfer	19	1,041	30,909	3.4
Cheque	60	1,804	39,747	4.5

Note: Hours calculated at 8 hours per day, so 24 hours in the table equals three days travel. Average subsidy received is the average of the two national TFF subsidy payments.

Are schools receiving the TFF payments in a timely manner?

The changes in the way schools received their funding have not adversely affected the timing of subsidy payments. In 2012 schools received their first payment, on average, a month earlier than 2011; their second payment arrived in August, the same month it did in 2011 (Table 5-5). Still, the timing of the first payment was later than it should have been. In 2012 the first payment (due in January) was on average two months late; it was even later in Morobe province, and very remote schools. This is concerning because if schools do not receive payments in a timely and consistent manner it makes planning and resource allocation difficult. The second payment arrived, on average, within the July/August timeframe set in the NDoE's Fee-Free Tuition Policy Management Manual.[14]

Table 5-5 also shows that 84 per cent of schools received both payments in 2012, a good outcome considering the short timeframe given to implement changes associated with the TFF. In East New Britain and Eastern Highlands all of the schools we visited received both payments. However, only 55 per cent in West New Britain and 65 per cent in Gulf received both payments. The more remote the school, the less likely it was to receive both payments. This suggests that

14. The NDoE's Fee Free Tuition Policy Manual (2012a) indicates that the second subsidy would be paid in July/August 2012, while the Ministerial Policy Statement suggests June/July. Given that the policy manual was designed as a guide for schools, and that they would therefore expect July/August as the date of arrival, we have used this timeframe for our report.

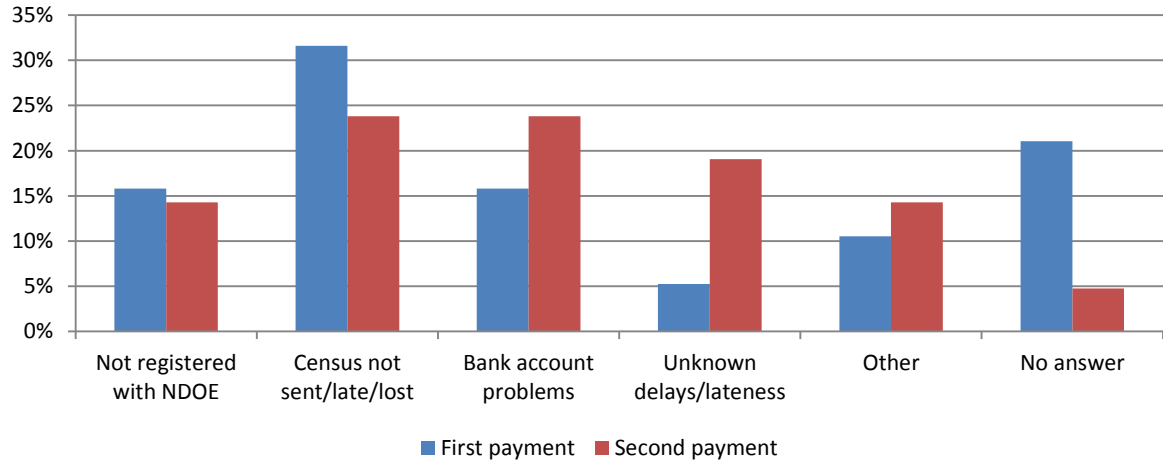
ensuring subsidy payments reach hard-to-get-to locations is a key policy challenge.

Table 5-5: Receiving subsidy payments in 2011 and 2012

	2011		2012		
	First subsidy received	Second subsidy received	First subsidy received	Second subsidy received	Received both subsidies (%)
Overall	April	August	March	August	84
East New Britain	April	September	March	September	82
West New Britain	May	September	March	September	55
Morobe	April	August	April	August	90
Sandaun	April	August	February	August	79
Eastern Highlands	April	September	March	August	100
Enga	April	August	March	September	100
Gulf	April	September	May	September	65
NCD	April	September	March	September	96
Government	April	August	March	August	85
Church	April	August	March	August	83
Readily accessible	April	August	March	September	94
Accessible	April	August	March	August	92
Remote	April	September	March	September	79
Very remote	April	August	April	August	71

The few schools that did not receive a payment (about 10 per cent for each of the two payments) said this was mostly due to issues related to getting the school census to the NDoE on time (Figure 5-2). Problems with bank accounts – which included bank accounts not being accessible or opened – also contributed to schools not receiving the second payment.

Figure 5-2: Reasons for not receiving a payment (2012)



Note: Data unweighted due to the small sample size: n=19 responses to reasons for first payment not delivered; n=21 for responses about second payment.

How effectively are subsidy payments being managed?

To work effectively, the TFF policy requires oversight from both the government and the school community. The NDoE acknowledges this, with improving education management the fourth goal of the TFF policy. To this end, the government funds Standards Officers and other district officers to monitor school expenditure and quality. School communities also play a role through their involvement in the Parents and Citizens (P&C) Committee and the Board of Management (BoM). This section looks at how these groups and others oversee and manage school subsidies.

Standards Officers and district officials

The TFF Policy Management Manual (NDoE 2012a) instructs BoM Chairs and Head Teachers to meet with district authorities twice a year to ensure they are using the TFF funding correctly. We asked Head Teachers how many visits they received from officials to verify subsidy spending or acquittals. Results from the survey suggest that the NDoE's target is not close to being met. 29 per cent of schools said they received a visit to check the subsidy payment in 2011, and 33 per cent said they received a visit in 2012 (Table 5-6). Only 39 per cent received a visit in 2011 *or* 2012. This suggests that in both years inspections mostly occurred in the same schools. These visits were least likely to take place in Gulf, Eastern Highlands and West New Britain. Schools that received a visit were inspected 1.4 times in a year in 2011 and 2012. Only Gulf (in 2011) and Enga (2011 and 2012) received two or more visits.

In over 90 per cent of cases, Head Teachers said that schools acquitted subsidies before the next allocation was received; 60 per cent of schools sent their acquittals to the province, while just under 40 per cent sent them to the district administration (data not shown in table). In order to improve accountability it is important that schools receive regular feedback on these acquittals. Table 5-6 shows that only a third of all schools received feedback; the number was lowest in Gulf (10 per cent), and highest in Eastern Highlands (51 per cent). With such poor feedback it is likely that fewer and fewer schools will acquit their subsidies over time.

Table 5-6: Supervision of subsidy payments

	% schools that received visit to check subsidy payment			If visited, number of visits		% schools received feedback
	2011	2012	2011 or 2012	2011	2012	2012
Overall	29	33	39	1.4	1.4	34
	(3.0)	(3.1)	(3.3)	(0.1)	(0.1)	(3.1)
East New Britain	38	37	44	1.4	1.2	33
West New Britain	8	21	21	1.7	1.5	39
Morobe	40	38	43	1.6	1.4	29
Sandaun	21	36	52	1.5	1.3	25
Eastern Highlands	22	28	24	1.5	1.2	51
Enga	30	37	40	2.4	2.0	40
Gulf	15	30	32	2.0	1.4	10
NCD	70	41	77	1.4	1.5	43
Government	26	30	35	1.2	1.2	32
Church	31	36	43	1.7	1.6	36
Readily accessible	39	26	43	1.1	1.1	37
Accessible	32	37	45	1.4	1.3	29
Remote	26	30	32	2.5	1.6	58
Very remote	21	34	33	1.9	1.7	26

Note: Research teams visited schools between October and November 2012, so the 2012 figures may be underestimates for the full year.

School management

The TFF Policy Management Manual also stresses that Head Teachers, BoM and P&C members all have a crucial role to play in monitoring and managing subsidy payments. People representing all three of these institutions are encouraged to reach consensus on what the TFF funding will be spent on. Chapter 3 showed that the BoM manages school assets, but that its role can be hampered by diminished access to school financial records, particularly when Head Teachers leave the school. It also highlighted the lack of input the P&C has around budgetary consultation, with only one quarter of P&C members saying that they had been consulted about the budget.

According to Head Teachers and Grade 5 teachers, decisions about spending school subsidies in particular are becoming increasingly determined by the BoM rather than the Head Teacher (Table 5-7). In 2012, the BoM was considered the key decision maker of how funds are spent. P&C Committees clearly do not play a leading role in deciding on how subsidies are spent – no Head Teacher said their P&C Committee had most say over school subsidy spending, which was essentially the same response from Grade 5 teachers.

Table 5-7: Most say over spending school subsidies (%)

	Head Teachers		Grade 5 teachers	
	2002	2012	2002	2012
BoM	48(3.2)	67(3.0)	35(3.3)	71(3.0)
Head Teacher	46(3.0)	31(2.9)	50(3.3)	24(2.8)
National Government	0	0	0	0
Provincial Government	4	0	3	1
District/Standards Officer	1	0	1	1
P&C/parents	0	0	0	1
Other	0	1	9	2
Total	100	100	100	100

It is encouraging to see the increased role the BoM is playing in managing school resources: all the more reason to give them full access to financial records. Table 5-7 shows that the P&C do not have the most say over funding decisions, but what is more worrying is that, as shown in Chapter 3, this body is infrequently consulted about the budget or other school decisions. The low level of engagement that the P&C committee has in decision making is concerning, particularly as previous studies (World Bank & NRI 2004; World Bank 2009) highlight the importance of the community in helping schools improve the quality of education.

5.4 Is the TFF policy achieving its objectives?

This section looks at whether the TFF is achieving its objectives. It focuses on the impact of the policy on access, quality and equity.

What impact has the TFF had on access to education?

Chapter 3 showed that enrolments have increased by more than 50 per cent over the decade. To get a sense of how the TFF has contributed to this increase, here we examine changes between 2011 and 2012 (the year the TFF was introduced). Given that a tuition free policy was also introduced in 2002, we also compare figures from 2001 and 2002. This means we can assess the impacts of the 2012 reform in relation to the previous attempt to introduce a tuition fee-free policy.

Table 5-8 shows that the introduction of free education policies increased enrolments by 17 per cent between 2001 and 2002, and by the same amount between 2011 and 2012. In 2012, Gulf saw the highest rate of growth, with enrolments increasing by 52 per cent over the previous year. There are two important conclusions to draw from the large changes over the two time periods. First, the magnitude of these increases in enrolments in a single year is large, given an average annual increase in the PNG population of around 3 per cent and an average annual increase in enrolments between 2002 and 2011 of 4.6 per cent. Second, the increase in enrolments in 2012 is particularly impressive since it is from a higher base.

Table 5-8: Average enrolments per school

	2001	2002	Change 2001-2002	2011	2012	Change 2011-2012
Overall	159	186	17%	253	294	17%
	(19.4)	(13.4)		(16.4)	(18.5)	
East New Britain	172	192	12%	233	240	3%
West New Britain	136	165	21%	224	246	10%
Morobe	95	104	9%	156	174	11%
Sandaun	89	130	46%	169	191	13%
Eastern Highlands	161	247	54%	315	409	30%
Enga	283	282	0%	453	530	17%
Gulf	85	109	28%	134	202	52%
NCD	759	637	-16%	957	1,059	11%
Government	185	211	15%	268	317	18%
Church	148	154	4%	228	265	16%
Readily accessible	340	377	11%	507	547	8%
Accessible	154	173	12%	278	337	21%
Remote	102	111	8%	178	223	25%
Very remote	91	95	4%	126	143	13%

Note: Based on the Head Teacher survey and, where there are missing values, statistics from the NDoE.

Table 5-9 shows the change in enrolment for each grade in 2012 relative to 2011. The largest increase in enrolments occurred in Grade 6, while only small increases occurred in Grade 7 and 8. There were solid increases in enrolments at every grade in the Highlands provinces (Eastern Highlands and Enga). Schools in accessible areas recorded strong growth in all grades, an average increase of 15 per cent.

Table 5-9: Growth in enrolments by grade (%): 2011-2012

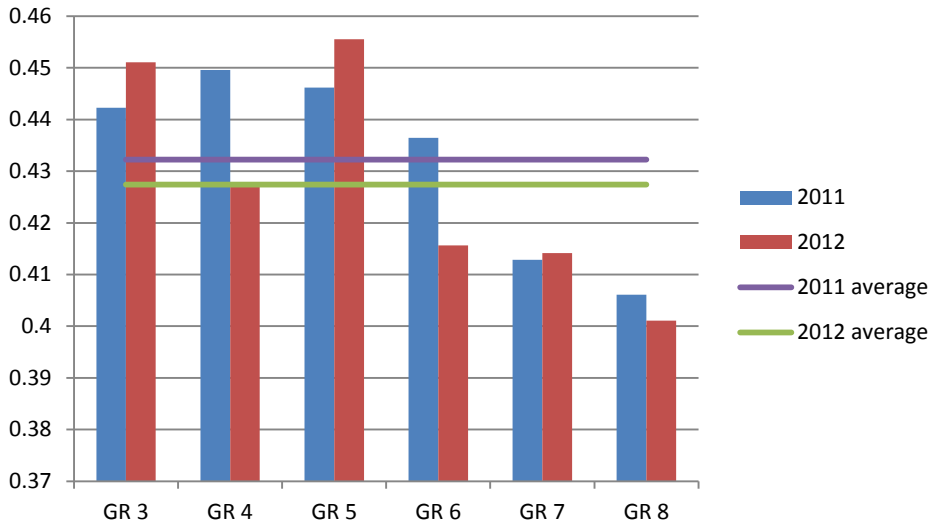
	GR 3	GR 4	GR 5	GR 6	GR 7	GR 8
Overall	8.4	13.0	10.4	19.7	3.3	2.1
	(3.0)	(3.2)	(4.6)	(4.5)	(3.6)	(3.5)
East New Britain	10.9	-1.7	3.3	14.2	8.9	-6.8
Eastern Highlands	21.6	34.1	28.3	17.5	12.8	22.0
Enga	17.1	32.9	28.5	37.2	26.3	27.4
Gulf	8.1	23.4	60.4	-24.8	-1.9	-51.0
Morobe	0.8	8.5	3.8	25.5	1.1	5.6
National Capital District	12.9	10.4	8.2	12.1	13.3	11.1
Sandaun	-8.2	-0.5	-10.9	20.3	2.0	-8.4
West New Britain	16.7	5.9	-4.3	26.2	-25.3	-4.5
Government	8.2	13.2	18.5	6.8	6.8	6.2
Church	9.3	11.3	13.0	30.6	1.2	-5.0
Readily accessible	15.6	20.5	6.0	15.0	13.0	8.0
Accessible	12.2	15.1	14.0	27.7	11.4	18.2
Remote	8.5	2.1	2.2	17.5	-21.3	19.5
Very remote	-0.1	11.4	19.9	13.4	-2.5	-32.7

Notes: Data sourced from NDoE (PEPE sample of schools only).

According to the policy, the TFF was especially intended to increase access for girls. Because the policy led to higher rates of enrolment, it did increase overall access for girls. However, it did not improve girls' enrolment relative to boys. There was some slight variation from grade to grade (Figure 5-3), but overall the share of girls in the total number

of students was steady at around 43 per cent for 2011 and 2012. Still, Chapter 3 shows that the ratio of girls enrolled has increased dramatically over the decade.

Figure 5-3: Girls' share of enrolment by grade



Source: As per Table 5-8.

Chapter 3 showed that absenteeism has increased over the decade and is a problem for many schools. So the effects of these enrolment figures would have been softened somewhat by absenteeism – which is worth keeping in mind when reading the following section about how this growth has affected school quality. Still, the increase in enrolments between 2011 and 2012 is a clear indication that the policy has substantially increased access to schooling for children across the country.

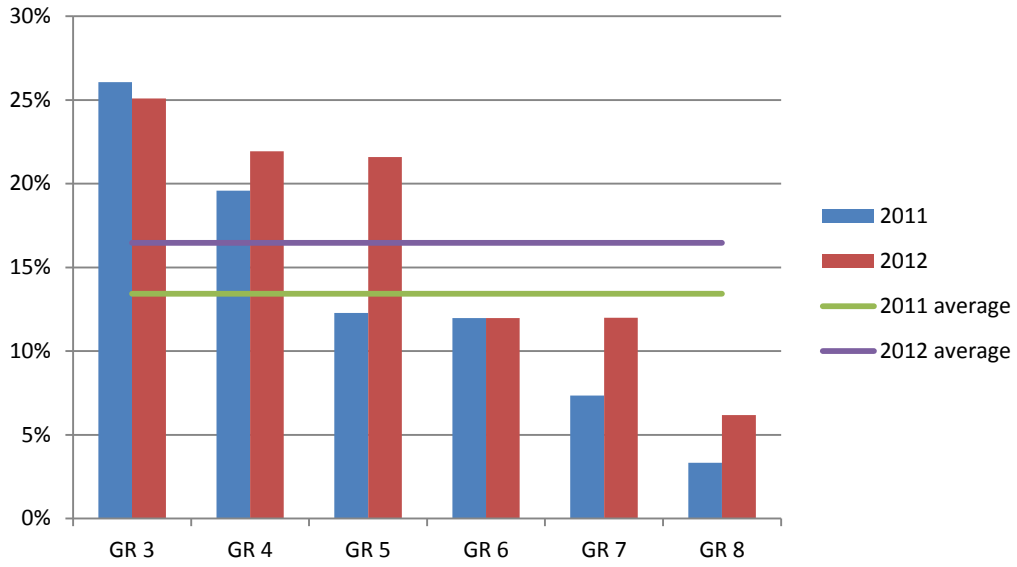
How has the TFF affected quality?

The third goal of the TFF policy is to improve the quality of schooling. Chapter 3 showed that the quality of education facilities over the last decade has, by and large, improved in terms of the condition of buildings, availability of water, and other key resources. Yet, it also showed that schools face challenges associated with overcrowding. The TFF has contributed to this overcrowding, which makes the official goal to reduce classes with more than 45 students to zero by 2019 (NDoE 2009) even more difficult.

Figure 5-4 shows that the share of classes with more than 45 students has increased in 2012 relative to 2011, and that growth has been particularly high in grades 5, 7 and 8. In 2012, the level of crowding was, in both years, worse for lower primary grades. Overcrowding would have likely been worse if it wasn't for teachers being reallocated to the lower grades where overcrowding was more of an issue. According to data from the NDoE, between 2011 and 2012 the number of teachers in Grades 3 and 4 grew by 5 per cent, in Grade 5 it grew by 2 and in Grade 6 by 3 per cent. This suggests teachers were

reallocated from the higher grades to overcrowded lower ones: Grade 7 teachers reduced by 3 per cent and Grade 8 by 4 per cent between 2011 and 2012.

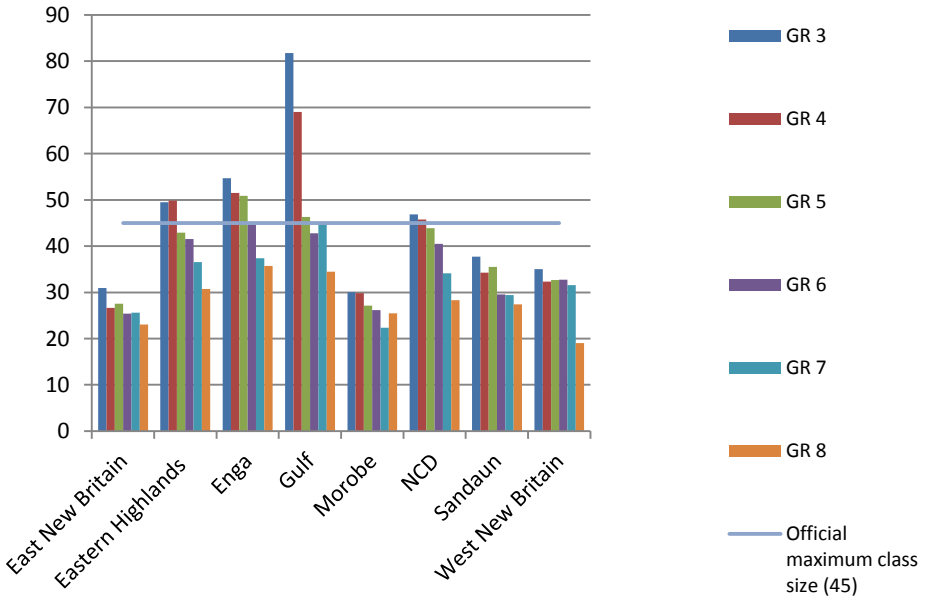
Figure 5-4: Share of classes with more than 45 students



Source: As per Table 5-8.

Figure 5-5 shows that, as we saw in previous analysis (Figure 5-4), the impact of overcrowding appears most apparent in early grades. Gulf is a standout for being particularly crowded in early grades. In 2012 it had over 80 students per teacher in Grade 3 and almost 70 per teacher in Grade 4.

Figure 5-5: Average enrolled students per teacher in 2012



Source: As per Table 5-8.

How has the TFF affected equity of education?

Our survey asked Head Teachers how much tuition and project fees (fees charged per student to cover school projects) were in 2011 and 2012, and to estimate additional costs associated with schooling (such as for books and uniforms). Based on the answers to these questions, between 2011 and 2012 the total cost of schooling – including school fees, project fees and associated costs (books, uniforms, etc.) – fell by 92 kina per student per year on average (Table 5-10). The TFF policy has clearly driven this change, with school fees reducing from just under 100 kina in 2011 to 9 kina in 2012. Project fees have, overall, not increased to make up for the reduction of school fees. Prior to the abolition of tuition fees, the central government only imposed maximum limits, so there was variation from province to province. NCD was the most expensive province in which to send a child to school. In 2012 it cost parents almost 94 kina per child per year, but this was 224 kina less than the cost in 2011.

Table 5-10: Official school costs (in Kina per child, constant 2012 prices)

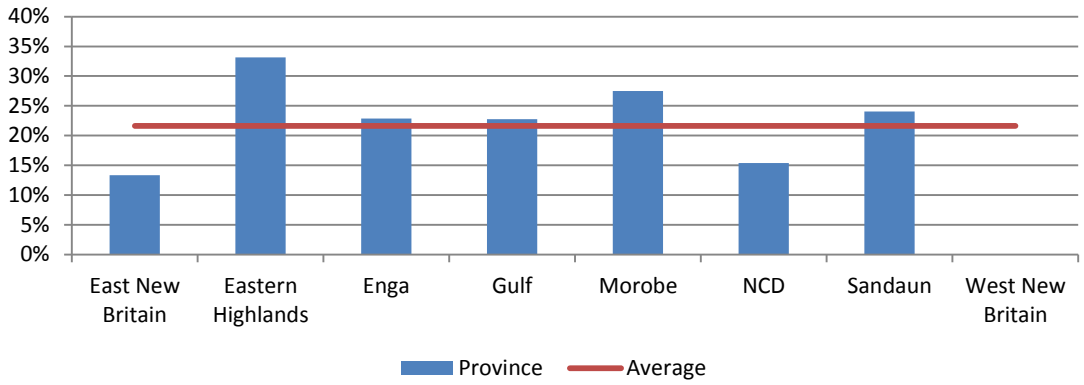
	Tuition fees		Project fees		Additional costs		Total costs	
	2011	2012	2011	2012	2011	2012	2011	2012
Overall	97	9	28	26	5	4	131	39
	(4.5)	(1.5)	(2.7)	(2.3)	(1.6)	(1.3)		
East New Britain	87	2	37	56	0	0	124	58
West New Britain	98	17	41	32	5	3	143	52
Morobe	74	17	32	27	0	0	106	43
Sandaun	88	3	25	25	8	4	120	32
Eastern Highlands	136	1	14	0	5	2	155	4
Enga	96	2	21	17	2	3	119	22
Gulf	77	14	28	31	10	11	114	57
NCD	225	13	23	30	71	50	318	94
Government	110	7	30	26	6	4	146	37
Church	77	10	23	24	2	5	103	39
Readily accessible	118	6	20	26	3	4	141	36
Accessible	87	8	22	16	5	6	114	30
Remote	91	7	30	34	9	2	129	43
Very remote	80	11	57	30	7	3	143	44

Note: Calculated by averaging costs for upper and lower primary.

While costs have fallen, many parents nevertheless said they could not afford the fees set by the school in 2012. Figure 5-6 shows that, on average, one-fifth of P&C members reported that they could not afford project and tuition fees. Over 30 per cent of respondents in Eastern Highlands said they could not afford fees, which contrasts markedly with West New Britain, where no P&C Committee member said that fees were unaffordable, even though this province charged substantial school and project fees. On a visit to West New Britain, provincial administrators told us that this was likely because of the income that many families received from oil palm. The high proportion of respondents in Eastern Highlands stating that they cannot afford fees is counterintuitive given that this province had the lowest level of fees. The difference between these responses may reflect the high levels of

fees charged in the past – this province had one of the highest costs associated with schooling in 2011.

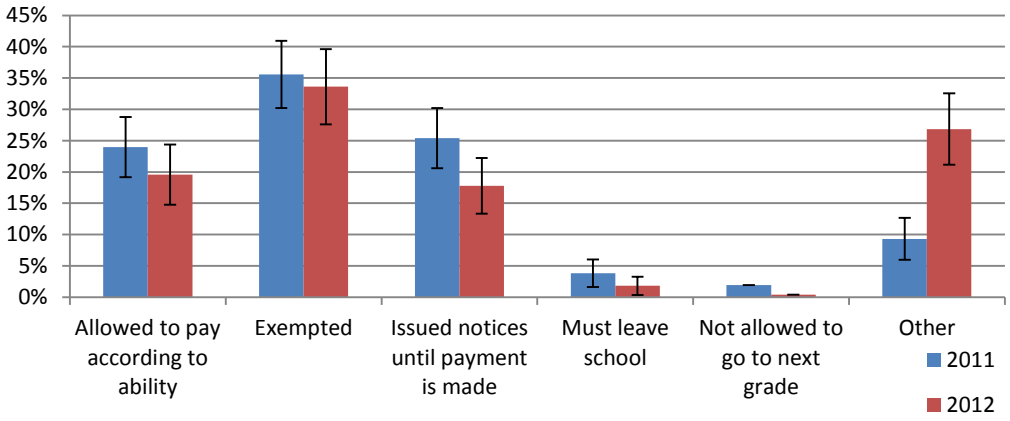
Figure 5-6: Percentage of P&C respondents who could not afford fees (2012)



Source: P&C Committee survey.

Not being able to pay does not exclude students from school. Around one-third of Head Teachers said that such students were exempted from fees in 2012, the same proportion exempted from all fees (project and tuition) in 2011 (Figure 5-7). In 2012 one-fifth said parents could pay according to ability, just over 15 per cent said parents were issued with a notice or warning. Less than 5 per cent said students were expelled in 2011 and 2012. In other words, when parents lacked the ability to pay fees their children were still being accepted into school even before the TFF was introduced.

Figure 5-7: What happens to students unable to pay fees?



There is no doubt that the TFF policy has made education substantially more affordable, and therefore equitable. According to the 2009-10 Household Income and Expenditure Survey, 33 per cent of parents said their children were not going to school because of fees, by far the most common reason. The figure was 35 per cent for parents who had girls and 50 per cent for those in the poorest wealth quintile of families (NSO 2013). At the same time, it should be noted that because fee policies were implemented with some flexibility (that is, some parents were

exempted from paying fees), the official costs shown in Table 5-10 overestimate the impact on families of fee abolition. As Table 5-2 shows, actual fees paid by families were on average K52 per student in 2011 and K12 in 2012, well below the official fee levels (tuition and project fees) of K125 and K35 shown in Table 5-10.

5.5 Conclusion

Overall, the survey suggests that, while it is early days, the TFF policy shows a number of indicators of success. The great majority of schools are receiving the payment they should, and through their bank accounts as they should. Increasingly, the BoM is seen as playing a crucial role in the spending of subsidy payments, as it should, though it needs to be better equipped with financial information. Schools also expect to acquit funds before the next payment is received (although they are rarely provided with feedback on acquittals).

The TFF policy has increased children's access to education across PNG – a crucial (but not the only) step in achieving UBE. 17 per cent more students are enrolled in schools in 2012 compared to 2011, though declining attendance ratios soften this increase somewhat. The policy's longevity is also a step forward for PNG – this effort has lasted longer than any previous attempt at fee-free education in PNG.

In real terms, the school subsidy has more than made up for fees no longer paid by parents, and compensated for a reduction in payments from provinces. This in itself is an achievement. The World Bank's (2009) review of free education policies in Africa found that in some cases replacement revenues did not sufficiently make up for revenues lost. By and large this has not been the case in PNG; indeed viewed over the entire decade, school revenues have risen sharply, both in total and per student (see Chapter 3).

However, there are many areas in which the TFF could be better implemented. The findings raise serious concerns about the monitoring of the TFF subsidy. Checks on how the subsidies are being spent are rare, far fewer than twice a year, as should be the case. More needs to be done to ensure that education officials are monitoring subsidy payments; and at the very least, that they visit different schools every year, rather than the same schools as at present. Increased monitoring should also focus on enrolment and absence rates, to ensure enrolments are not inflated to get extra funding for schools.

The TFF policy stipulates that school spending decisions be jointly undertaken by the Head Teacher, BoM and P&C Committee. But, as Chapter 3 highlighted, the latter are rarely consulted about financial issues. The importance of involving communities in funding decisions has been shown to be crucial to improving school performance in PNG and in other countries. In Mozambique, for example, empowerment of the local community to monitor subsidy payments helped to improve administrational efficiency and created a stronger constituency that

supported education (World Bank 2009). Improving the P&C committee's role in monitoring subsidies, and school finances more generally, should be made a priority in the future, particularly given the low levels of school visits made by education officials to check school subsidies.

While enrolments have increased, Chapter 3 showed that attendance has decreased. One likely reason for this is that Head Teachers have an incentive to inflate enrolment rates to maximize their subsidy payments. To this extent, the school subsidy bill is inflated by the link to enrolments. It may not be practical to link subsidy payments to actual attendance rates (although this could be a longer-term goal). But if inspections reveal a high level of absenteeism, school enrolment figures should be challenged. For this to work, however, Standards Officers and others will need to regularly monitor attendance at schools.

This chapter (as well as Chapter 3) highlight the difficulties that schools in remote areas have in accessing funding – remote schools have to pay substantially more to access their subsidies. The difficulties faced by schools in remote locations have been recognised in the report *Go Long Ples* (NEFC and NDoE 2013). It recommends that the TFF should be continued as a minimum guarantee to all schools – that is, that no schools should see their TFF subsidy cut. In addition, it argues that schools in remote locations should receive between 10 and 58 per cent extra depending how remote they are. It estimates that the scheme would cost between 10 to 15 percent of the annual TFF payments, which would equate to 70 to 105 million kina.

Our findings around the cost for schools in accessing tuition fees and the poorer quality of remote schools support moves to increase the subsidy for schools that are particularly remote. However, the grounds for increasing the total aggregate provided in subsidies are weak given how much better off schools are now financially than ten years ago (as shown in Chapter 3) and given the need to reduce class sizes. Rather, much more funding needs to be directed towards increasing the stock and quality of teachers. The school subsidy itself could be better targeted, with increases to more remote schools paid for by decreases to less remote ones.

The survey results strongly show that increases in school enrolments have put great pressure on existing resources – PNG is certainly experiencing "access shock". In 2012, the year the TFF was introduced, the share of classes with more than the maximum target of 45 students increased to 16 per cent from 13 per cent in 2011. These quality concerns are manifest in both urban locations (like NCD) and remote provinces (such as Gulf). While this is to be expected given the big bang nature of the TFF policy, there is now a need to direct resources to hire more teachers to provide for a much larger cohort of students. This is discussed further in Chapter 9.

6 HEALTH FINANCING AND THE FREE HEALTH POLICY

6.1 Introduction

Health clinics can get support for their operations in one or more of three ways. They can receive funding in cash; they can get in-kind support; or they can raise funds themselves through user fees (or in some cases, by health workers donating their own salaries). One of the primary purposes of the PEPE health survey was to examine the financial support received at the facility level and how it translates into the delivery of services. There has been little systematic research on this subject to date.

PNG's free primary health care policy came into effect on 24 February 2014, after PEPE fieldwork was conducted. However, the survey findings offer useful insights into how the policy could impact the financial situation of health clinics. The Public Hospitals (Charges) Act (1972) sets user fees for hospitals, but states that all primary health services are to be provided free of charge. However, charging fees for primary health services has in fact been common practice (Sweeney & Mulou 2012; DLPGA 2009). The new free health policy aims to bring about an end to the practice of charging fees and to offset the lost income by providing subsidy payments from the central government to provinces to be distributed to health clinics.

The next three sections of this chapter explore the importance of each of the three sources of support for different types of health facilities: funding, in-kind and user fees. Section 6.5 brings them together to explore their relative importance. Section 6.6 discusses the implications of the findings for the government's new free primary health policy. The conclusion considers policy implications more broadly.

Most of the tables and figures in this chapter are based on responses by Officers in Charge (OICs) to a detailed set of questions about health clinic financing in the PEPE survey.

The chapter shows that health clinics struggle to access reliable funding to deliver services. Most clinics are reliant on in-kind support or need to raise funds themselves through charging fees. Many clinics receive no external support at all and the introduction of a free health policy risks making the situation worse. Some provinces support their health clinics much better than others and there is potential to learn from the practices of better performers.

6.2 Funding support

The PNG Government has significantly increased the size of health function grants paid to provinces to finance core health facility operations. These payments have steadily increased over time to reach

K64.4 million in 2012 and K73.8 million in 2013. Provinces should distribute the health function grant to their health clinics through funding budgets or as in-kind support from the provincial and district health office for materials and activities. National funding allocations for church-run health clinic operations are administered through Christian Health Services and were just over K21 million in 2012 (Piel et al. 2013).

Facility-level budgeting and annual activity plans have been widely promoted at the national level and in many provinces, particularly for health centres, as a way for clinics to access operational funding and support to deliver core services. But do health clinics submit budgets, and are they getting funding in return?

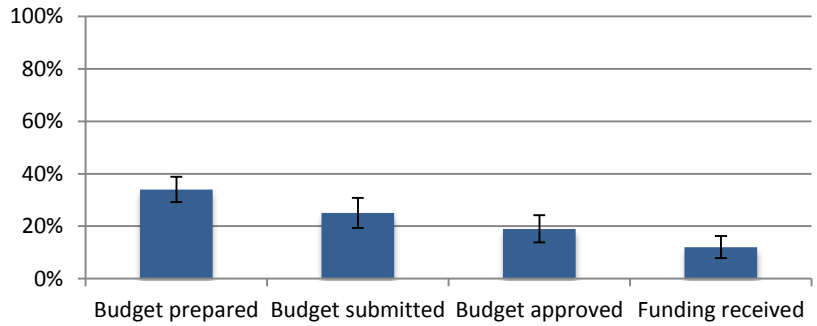
How many clinics submit budgets and receive funds?

The survey found at least eight different funding bodies to which health clinics submitted budgets (see Annex Table 6-A1 for the details). But, as Figure 6-1 shows, only 34 per cent of the health clinics surveyed in fact prepared a budget or plan for submission to any funding body at all.

One explanation for low rates of facility-level budgeting could be that health centres are much more likely to complete budgets and plans than aid posts. Health centres normally operate independently from their referral health facility, whereas an aid post is normally considered an extension of a health centre's operations. However, the variation in budgeting is lower than expected: only 41 per cent of health centres completed budgets, while for aid posts the figure was 25 per cent. The figure for health centres is surprisingly low considering the emphasis placed on facility budgeting.

Preparing a budget or plan represents only the first step of the budget process. There are a series of steps that health clinics should follow in order to receive funding. In 2012, 34 per cent of clinics prepared a budget, 25 per cent submitted them, 19 per cent had them approved, yet only 12 per cent actually received any funding as a result.

Figure 6-1: Clinics preparing and submitting budgets; and receiving approval and funding



Note: All percentages are of all clinics. Throughout the chapter, error bars represent 90 per cent confidence intervals.

Table 6-1 shows the details by province and clinic type. There are few obvious patterns, but East New Britain stands out at the top of each category. 80 per cent of clinics in East New Britain prepared health budgets and 33 per cent received funding in return. In Enga, only 11 per cent of clinics prepared budgets and none actually received funding.

Table 6-1: Clinics preparing and submitting budgets; and receiving approval and funding (%)

Percentage of clinics with budgets…	Prepared	Submitted	Approved	Resulting in funding
Overall	34	25	19	12
	(3.0)	(3.1)	(3.5)	(2.6)
East New Britain	85	62	48	33
West New Britain	38	29	7	7
Morobe	32	30	25	20
Sandaun	33	11	11	6
Eastern Highlands	38	27	18	18
Enga	11	11	11	0
Gulf	18	18	17	9
NCD	14	13	6	0
Health centre	41	31	24	16
Aid post	25	18	12	5
Government	33	22	18	11
Church	35	29	19	12

Note: In this and other tables in this chapter, the numbers in brackets are standard errors.

How much funding do clinics ask for, and how much do they receive?

The financial value of the budgets submitted varies significantly across funding providers (Table 6-2). The average budget submitted for funding in 2012 was K63,771. Health centre budgets averaged K87,067 and aid post budgets averaged only K8,706. Considering the health surveys were conducted towards the end of the year, health facilities should have received most of, if not all, their budgeted funding for 2012 (the PNG financial year follows the calendar year). For health clinics that submitted budgets, the value of the funding received was K31,645 -- about half the average value of the budgets submitted.

Church-run clinics submit much larger budgets (K107,500 versus K45,467 for government clinics) and receive, on average, about two-thirds of what they ask for, compared to only one-fifth in the case of government clinics. As a result, church clinics that submit budgets get K77,254 but government clinics only receive K9,567.

Table 6-2: Funding received from budget submissions

	Avg. value budget submitted (Kina)	Avg. value budget received (Kina)
Overall	63,771	31,645
East New Britain	61,000	15,467
West New Britain	74,000	123,683*
Morobe	102,408	92,195
Sandaun	10,000	1,666
Eastern Highlands	6,867	5,942
Enga	82,500	0
Gulf	137,667	53,666
NCD	37,500	0
Health centre	87,067	44,003
Aid post	8,706	2,434
Government	45,467	9,567
Church	107,500	77,254

Note: One health clinic in West New Britain received more than requested. These averages are over those clinics that submitted a budget.

Can health clinics receive funding without submitting a budget?

Just over 6 per cent of health clinics surveyed claimed to receive funding without submitting a budget, not much less than the percentage that received funding after submitting a budget (12 per cent). The average funding received by those facilities that did not submit a budget was more than K71,000, which is more than double the average for health clinics that submitted a budget. However, there is a significant range of values, stretching from K342,000 at a large rural hospital in Morobe to K1,200 at a small aid post in Gulf Province. (See Annex Table 6-A2 for further details.)

It was mainly church-run clinics that received funding without submitting a budget. The two government health clinics in this group did not get their funding from government grants but from donor programs or an NGO.

Clearly, the system of budget-based funding and cash support for health facilities has never been entrenched, despite the introduction of the health function grant.

There could be several explanations for how little cash clinics receive from external providers. Provincial governments might have higher priorities than health funding, or the funds might be used for administrative costs rather than being disbursed to the clinics. It may be a symptom of a poorly performing financial management system. Funding providers may intend to finance health facilities, but blockages in the process may mean they do not receive the funding. Alternatively, there may be a perception that health facilities lack the capacity to manage their own funding effectively. Such a decision could be justified considering that the OIC of most facilities is usually a clinical officer rather than a financial and administrative manager, and

that facilities lack local oversight of their operations. Provincial and district health officials, both church and state, may see financial management as their responsibility so that OICs can focus primarily on treating patients rather than managing accounts. In this case, we would expect external providers to assist through in-kind support.

6.3 In-kind support

We call in-kind support to deliver services 'administered assistance'. The survey asked health workers if they received administered assistance either for materials or to assist them to carry out activities from a funding provider (such as the government, a church health agency or a donor). In the case of materials, we also requested a valuation of the support received.

Purchasing materials on behalf of health clinics

36 per cent of health clinics reported that funding providers purchase supplies or materials on their behalf (Table 6-3). In contrast to funding support, slightly more government than church-run clinics received this kind of assistance.

Medical equipment and building materials were the most common supplies received from funding providers. More than half of the health facilities that received purchased materials and supplies provided estimates of the value of the goods received. The average was just under K40,000. Church agencies provided a higher estimate of K78,600, compared to K20,200 for government clinics. Although there are inherent limitations to the accuracy of these estimates, it is revealing that the estimated value of items received is still higher than the funding that health facilities receive from budget submissions.

Table 6-3: Clinics receiving supplies or materials from funding providers

	Percentage of clinics that received				Estimated value of items (if received) (Kina)
	Supplies/ materials	Building materials	Medical equipment	Fuel	
Overall	36	13	13	3	39,493
	(2.8)	(1.9)	(2.0)	(1.0)	
East New Britain	30	5	24	10	45,250
West New Britain	31	15	0	0	–
Morobe	40	14	19	0	26,000
Sandaun	28	6	6	0	7,750
Eastern Highlands	22	27	9	9	7,900
Enga	32	5	16	0	50,000
Gulf	41	0	30	13	72,626
NCD	56	0	50	0	15,333
Health centre	41	14	17	4	51,637
Aid post	26	12	9	2	6,100
Government	36	10	14	3	20,200
Church	36	15	15	4	78,600

Notes: Building materials, medical equipment and fuel are all subsets of supplies/materials. There is also an 'other' category, not shown here. OICs in West New Britain did not provide estimated values of supplies or materials received.

Supporting health clinics to deliver health programs and activities

Funding providers also make available administered or in-kind support in the form of health activities and programs. This could include assistance in conducting an immunisation patrol to villages, family planning and health promotion activities or even transferring sick patients from a health centre to a hospital. Survey data reveals that almost half of the health clinics surveyed claimed to receive support in this form (Table 6-4). This makes it the most common way for funding providers to support health clinics.

Almost half of the health clinics that receive activity and program-based support requested this support, whereas the other half said that it was delivered at the discretion of their funding provider (Table 6-4). This provides an insight into who makes decisions on what services health clinics deliver. Across the provinces, 90 per cent of health facilities in Morobe Province requested support, while only 20 per cent in Enga Province and Gulf Province did. This finding suggests that provinces and their funding providers have their own policies for determining whether decision-making authority lies with the funding provider or the health facility.

Table 6-4: Clinics receiving support for activities and programs (%)

	Received support through programs	If received, requested by health facility?	Clinics satisfied with support received		
			Very satisfied	A little satisfied	Not satisfied
Overall	46	55	48	32	20
	(8.3)	(5.4)	(5.4)	(5.1)	(4.4)
East New Britain	52	45	45	9	45
West New Britain	54	42	57	29	14
Morobe	43	89	56	22	22
Sandaun	50	55	33	44	22
Eastern Highlands	60	83	33	33	33
Enga	22	20	25	50	25
Gulf	61	21	43	36	21
NCD	31	40	80	20	0
Health centre	52	65	39	35	27
Aid post	39	44	61	26	13
Government	45	69	39	37	24
Church	49	46	55	19	26

It would not have been realistic to ask OICs to quantify the value of the support they received through activities and programs. Instead, we asked them to judge the quality of support provided. 48 per cent were very satisfied, and only 20 per cent were not satisfied (Table 6-4). One of the better performing provinces in the survey, East New Britain, recorded the highest percentage of health facilities expressing dissatisfaction with the administered support provided. Since East New Britain has the highest percentage of facilities that prepare and submit budgets to funding providers, this could indicate a degree of

autonomy in deciding on and carrying out operations. The data also suggests that the opposite is true as well: NCD has low rates of health facilities that complete budgets, so they are almost completely reliant on their funding providers for administered support, and some 80 per cent of NCD health facilities reported that they were 'very satisfied' with administered support.

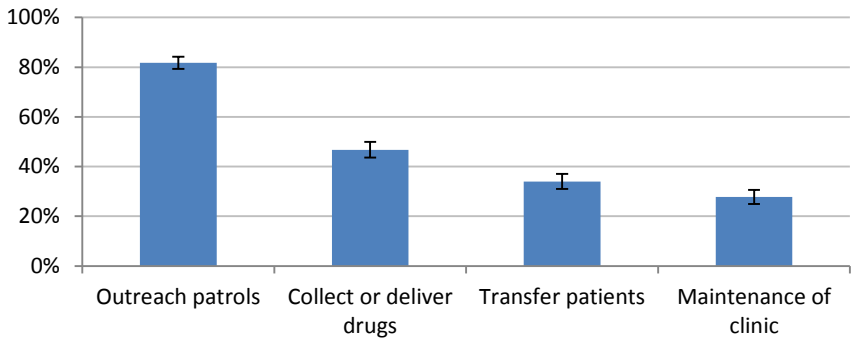
We also asked OICs what the program and administrative support was for. 80 per cent of those who received such support said it helped them to conduct patrols: see Figure 6-2 (and Annex Table 6-A3 for details). This result is consistently high across all the provinces except for NCD, which is to be expected given its dense population.[15]

Another area where administered support seems to assist health clinics is in collecting and delivering medical supplies. Almost half of the health clinics receiving administered support to deliver services believed it helped them manage their drug supply. It is not uncommon for provincial and district health offices to keep the component of the health function grant that funds the costs of distributing medical supplies. The large majority of health clinics do not have ambulances, let alone vehicles for collecting and distributing medicines. Most are therefore reliant on district and provincial health vehicles to distribute medicines to the facility-level.

The other two activities for which health clinics receive substantial administered support are patient transfers and maintenance. For administered support assisting in the maintenance of the health facility, church-run clinics are more likely to be supported than government clinics. This finding is consistent with church-run health clinics claiming that they more regularly carry out maintenance (see Table 4-7 for further details). Funding providers are much more likely to provide administered support for patient transfers to health centres than aid posts. This is concerning because patient transfers are just as important at aid posts, which are often harder to reach.

15. There are several different types of health patrols, such as maternal and child health patrols, immunisation, supervisory and integrated patrols. An important finding from the District Case Study (DLPGA 2009) was that many provincial and district health officials regularly assisted health clinics to conduct immunisation patrols on an annual basis. These types of patrols were mainly funded through joint donor trust funds under the Health Sector Improvement Program. It is therefore possible that a high percentage of OIC's may have been referring to administered support for immunisation patrols, which are not necessarily focused on providing primary rural health care. Therefore, it is unclear whether administered support assists health clinics to regularly conduct immunisation or primary health care patrols.

Figure 6-2: Administered support helps clinics to conduct the following activities



6.4 User fees

There is very little data across a large sample on the fees that primary health care clinics charge patients. As noted earlier, the practice is against the law, although it is known to be widespread. Clinics can raise fees in one of two ways: as consultation fees for services provided, or as charges for drugs and other medical supplies. These are considered in turn below.

Consultation fees for services provided

There are a range of services that may or may not be charged for. Table 6-5 shows the percentage of clinics that charge children and adults for specific treatments. In the case of children, only 30 per cent of health clinics charged for stitches, and the average price for those that did charge was K7.14. 66 per cent charged for a general consultation with a child, but the price (K1.15) was much lower. 31 per cent of health clinics charged for maternal care services.

Specific services that health clinics are more likely to charge for also incur a higher price. One such example is treatment for injuries resulting from domestic violence, where about 60 per cent of health facilities charged a fee of close to K25 on average. Similarly, more than half of the health clinics surveyed charged for treating patients involved in tribal fights. In general, there was little difference between church and government clinics in terms of either their propensity to charge or the amount of the fees they charge, but 40-49 per cent of church clinics charged for consultations relating to domestic violence or tribal fights, whereas only 17-19 per cent of government clinics did.

Anecdotal explanations from survey fieldwork reveal that several health clinics regarded high pricing as a disincentive for communities to engage in domestic violence and tribal fights. This explanation may make more sense for treatment of injuries related to tribal fights: the high cost associated with treatment of injuries related to domestic violence seems to punish the victim. However, a senior administrator from a large rural hospital in the Highlands explained that women

plead with the hospital to keep these costs high because the man, or his extended family, end up paying the fees, which acts as a disincentive for violent behaviour.

Table 6-5: Service charges for common treatments – children and adults

	Charge fee for service (%)	Average cost if charged (Kina)
Specific to children:		
General consultation	66 (2.7)	1.15
Immunisation	20 (2.3)	1.21
Disease testing	17 (2.1)	5.26
Stiches	30 (2.6)	7.14
Specific to adults:		
General consultation	69 (2.6)	1.62
Maternal care	31 (2.6)	10.43
Births	35 (2.7)	15.71
Domestic violence	63 (2.7)	23.50
Tribal fights	59 (2.8)	25.68

Fees for drugs and medical supplies

The other way for health clinics to raise revenue is by charging for drugs and supplies for patients. As Chapter 4 showed, there is an increasing tendency for health clinics to offer drugs free of charge (see Figure 4-5). Nevertheless, on average, 42 per cent of clinics reported charging patients across 12 common drugs and medical supplies.

As Table 6-6 shows, there was a significant range in both availability and cost across the 12. The table shows that 11 per cent of health clinics charged for condoms, and 63 per cent for baby books. 49 per cent of clinics charged for a common drug such as paracetamol. Average charges, when imposed, ranged from 1 to 8 kina.

Table 6-6: Charges for common drugs and supplies at health clinics

	Available at time of survey (%)	Charge fee for medication (%)	Average cost if available and charged for (Kina)
Common drugs:			
Paracetamol	77 (2.3)	51	1.30
Amoxicillin	91 (1.7)	45	1.30
TB blister packs	36 (2.8)	31	1.46
Maternal and child health:			
Pregnancy tests	16 (2.1)	67	7.88
Baby books	35 (2.7)	63	2.40
Measles vaccine (HC+ only)	75 (2.8)	17	1.70
Ergometrine (HC+ only)	75 (2.8)	31	6.41
Condoms	82 (2.2)	11	1.21
Anti-malarial drugs:			
Fansidar	95 (1.1)	47	1.17
Choloquine	95 (1.2)	45	1.20
Mala-wan	50 (2.9)	49	1.42
Malaria RDT	45 (2.9)	37	1.42
Average	65	42	2.40

Table 6-6 reveals significant variation in charging practices across provinces. For example, about 90 per cent of health clinics in Gulf Province offered paracetamol free of charge, whereas only 28 per cent did in Morobe Province.

Total fees raised by health clinics – consultations and drugs

Across the whole sample, Table 6-7 shows that health clinics raise, on average, about K7,000 a year from charges for services and drugs or supplies. This is based on OIC estimates for an average month. This average hides a huge variation across provinces. East New Britain health clinics collect more than K12,000 a year, while Gulf Province clinics raise an average of just over K700 in a year. One of the most significant reasons for the differences is that some provinces have had a free primary health care policy, while others have actively encouraged their facilities to charge fees.

The difference between user fees raised at health centres and aid posts is also large.

Table 6-7: Average annual user fees raised at health clinics

	Percentage of clinics charging patient fees	Average user fees raised (Kina)
Overall	83	6,998
	(2.1)	(68.7)
East New Britain	100	12,240
West New Britain	100	5,880
Morobe	79	8,734
Sandaun	69	2,261
Eastern Highlands	92	7,317
Enga	84	8,671
Gulf	54	1,311
NCD	87	6,166
Health centre	92	9,796
Aid post	75	3,344
Government	81	6,696
Church	87	6,772

Notes: The user fee averages and percentage charging take into account fees from both services (consultations) and for drugs and supplies. The averages are over those that do charge.

User fee affordability

Just less than half the surveyed OICs believed that all or most patients could afford the fees charged, while more than 70 per cent of users believed fees charged by the clinic are about the right amount (Table 6-8). OICs estimated that about 40 per cent of families nevertheless received free treatment. This indicates that user fees have been charged flexibly. Church-run clinics had a higher estimate of the affordability of their fees, and correspondingly were less likely to waive

them. Across all clinics, only 22 per cent of users believed fees were too high.

Table 6-8: OIC and user views on fees, affordability and exemptions

	Perspective of OICs (%)		Perspective of users (%)		
	All or most patients can afford fees	Proportion of families receiving free treatment	Fees too high	Fees too low	Fees about right
Overall	46	41	22	7	71
	(7.0)	(2.8)	(2.1)	(1.3)	(2.3)
East New Britain	62	22	34	10	56
West New Britain	29	28	28	5	67
Morobe	44	44	17	0	83
Sandaun	39	68	17	8	75
Eastern Highlands	40	04	38	6	55
Enga	47	67	6	24	70
Gulf	45	82	10	0	90
NCD	69	42	21	0	79
Health centre	52	32	27	8	65
Aid post	39	50	16	8	76
Government	39	46	25	10	65
Church	52	36	24	3	73

Table 6-9 compares responses from OICs and users on the question of patients who cannot afford health services. 18 per cent of community respondents, but only 1 per cent of OICs, reported that non-payment resulted in non-treatment. Perhaps this is not surprising, as OICs might be unlikely to admit that they refuse patients treatment.

The Eastern Highlands had by far the highest proportion of users and OICs who said that non-payment resulted in non-treatment: 43 and 9 per cent respectively. Numbers for other provinces were 30 per cent or less for users and virtually zero for OICs. This indicates that both provinces and health clinics may have substantial discretion in formulating their own policies and plans for delivering services.

Table 6-9: What happens if you don't pay user fees? Community and OIC views

	Perspective of OICs				Perspective of users			
	Exempted	Pay according to ability	Pay in-kind	Refused treat-ment	Exempted	Pay according to ability	Pay in-kind	Refused treat-ment
Overall	37	35	19	1	34	30	10	19
	(2.8)	(2.8)	(2.3)	(0.6)	(3.0)	(2.9)	(1.9)	(2.9)
East New Britain	48	52	0	0	38	37	0	19
West New Britain	29	29	29	0	43	29	0	14
Morobe	56	22	22	0	67	12	8	8
Sandaun	44	33	6	0	7	40	20	27
Eastern Highlands	27	55	9	9	0	57	0	43
Enga	21	68	5	0	50	19	15	11
Gulf	48	13	17	0	20	20	49	11
NCD	82	6	6	0	86	0	0	14
Health centre	45	39	7	2	30	27	7	29
Aid post	32	32	29	0	38	33	14	10
Government	46	31	14	2	35	33	11	14
Church	36	37	23	0	34	21	11	27

Note: This table shows only the most common responses (as well 'Refused treatment'), so totals may not add to 100 per cent.

6.5 The relative importance of different financing sources

The data presented in previous sections of this chapter showed the reliance of health clinics on different financing sources. This section summarises the overall picture, in three different ways.

Table 6-10 summarises the support that health clinics receive across the three sources. Overall, only 18 per cent of health clinics receive cash funding (whether or not as the result of a budget request). 58 per cent receive in-kind support through either purchased materials or as in-kind support for health activities. 83 per cent raise some funds through user fees.

Health clinics may be either reliant on one source of support, a combination, all three or none at all. 41 per cent receive no external support at all. Of these clinics, 29 per cent are reliant only on user fees but nine per cent do not even receive fees, meaning they do not receive anything to deliver services. Aid posts are less likely to receive support than health centres for their basic operations.

Table 6-10: Extent of support received from funding, in-kind and fees (%)

	All	Health centre	Aid posts	Government	Church
In receipt of					
Funding	18 (2.2)	22	15	12	24
In-kind support	58 (2.8)	68	46	57	60
External support (funding or in-kind)	59 (2.8)	71	46	59	62
User fees	83 (2.8)	92	75	81	86
No external support	41 (2.8)	29	54	41	38
... But user fees	29 (2.6)	25	36	32	26
... No user fees either	12 (1.9)	4	18	9	12

Table 6-11 adds in information on how much is received. This is not available for in-kind program support, but it is still insightful. The average primary health clinic in PNG gets K24,000 in non-salary operational support (excluding program support). This can be compared to the K87,500 in non-salary support schools get, nearly all in funding (not in-kind). An aid post on average gets only K4,200. Church clinics receive much more than government clinics on average: K43,500 compared to K13,700. There is significant provincial variation with clinics in Sandaun and Eastern Highlands getting less than K10,000 each on average. Gulf and East New Britain clinics receive similar amounts on average, but East New Britain clinics get almost ten times as much in user fees, and a greater number get access to budget funding as well. This suggests that it is not just the total amount of resources that clinics have access to, but the form of those resources that matters.

Table 6-11: Average support received from funding, in-kind and fees

	Funding		In-kind		User fees		Total
	Share receiving	Value if receiving	Share receiving	Value if receiving	Share receiving	Value if receiving	Across all clinics
	%	Kina	%	Kina	%	Kina	Kina
Overall	12	31,645	36	39,493	83	6,998	23,823
East New Britain	33	15,467	30	45,250	100	12,240	30,919
West New Britain	7	123,683	31	-	100	5,880	-
Morobe	20	92,195	40	26,000	79	8,734	35,739
Sandaun	6	1,666	28	7,750	69	2,261	3,830
Eastern Highlands	18	5,942	22	7,900	92	7,317	9,540
Enga	0	0	32	50,000	84	8,671	23,284
Gulf	9	53,666	41	72,626	54	1,311	35,315
NCD	0	0	56	15,333	87	6,166	13,950
Health centres	16	44,003	41	51,637	92	9,796	37,224
Aid posts	5	2,434	26	6,100	75	3,344	4,216
Government	11	9,567	36	20,200	81	6,696	13,748
Church	12	77,254	36	78,600	87	6,772	43,458

Note: In-kind and therefore total figures unavailable for West New Britain clinics.

A third way to examine the relative importance of these sources of support is to find out how health clinics meet the costs of providing specific services. The PEPE survey asked health clinics how they met

the expenses to deliver seven key services and operational activities. These included the three Minimum Priority Activities (MPAs) – supposed to be supported through the health function grant – of outreach patrols, operations such as maintenance and the delivery of medical supplies. Three other important activities – patient transfers, maintaining utilities (such as a water supply) and paying casual staff (e.g. for porter or cleaning services) – were also included in the survey.

Respondents were given the following options for how they pay the expenses of delivering basic activities: own budget; request support from province/district/church/private/donor; user fees; own salary; referral health facility; other; or do not provide. The 'own budget' option refers to the use of funding received through the budget process or as direct payments. 'Requesting support from a funding provider' (province/district/church/private) refers to in-kind support. Choosing the 'referral health facility' option means that the supervising facility of the clinic being surveyed is responsible for the activity, such as a health centre in relation to an aid post that it supervises.

The first thing to note from Table 6-12 is that many services are simply not provided. On average, 29 per cent of the clinics surveyed responded that they did not provide the service in question. It also shows that user fees are the most important funding source for meeting the expenses associated with the three key services (casual wages, fuel and patient transfers). For the other three services – health outreach patrols, facility maintenance and collecting or delivering medicines – in-kind support is requested from funding providers. Contributions from health workers' own salaries is an important source of support for several activities. On average, user fees are as important a source of support as in-kind support for these seven services.

Table 6-12: Percentage of health clinics that normally meet expenses for conducting key health services through …

	Own budget	In kind	User fees	Own salary	Other	Referral health clinic	Do not provide
Health outreach patrols	11	31	11	5	12	12	27
Maintenance of facility	7	29	11	4	15	8	30
Collect/deliver drugs	11	26	25	9	13	17	8
Patient transfers	26	13	20	1	10	7	28
Maintaining utilities	11	21	18	3	10	7	39
Fuel for transport	13	10	24	6	10	5	40
Casual wages	14	10	23	3	6	3	40
Average	14	20	19	5	11	9	29

Note: 'Referral health clinic' means that the clinic to which the facility in question refers patients is responsible for the activity rather than the facility itself. Aid posts might respond in this way in relation to their supervising health centre.

On the whole, the survey findings show that clinics are often starved of support, and that user fees are a critical funding source for health clinics to carry out basic and essential operations. Clearly the current situation is unsatisfactory, as it is resulting in a large number of clinics

simply not providing services. Before considering new approaches, we first consider the likely impact of the free health care policy.

6.6 Implications for the free primary health care policy

Although the free health care policy was introduced in 2013, after the PEPE survey, the survey findings are of clear relevance to an assessment of its likely impact.

The first question that arises is whether the budgeted subsidy payments allocated under the new policy will be sufficient to offset the user fees that health facilities normally collect. Using survey data on user fees collected by health facility type, estimates of total annual fees raised were close to K12 million (Table 6-13). This figure is slightly higher than, but actually very similar to, the total subsidy allocations made through the free primary health care policy in 2014.

Table 6-13: Estimates of user fees (Kina) raised across health clinics

Facility type	Avg. user fees raised (Kina per clinic per month)	Number of health clinics	Total user fees per month (Kina)	Total user fees per year (Kina)
Health centre	568	201	114,110	1,369,308
Sub-health centre	854	428	365,623	4,387,479
Aid post	169	2,672	452,824	5,433,886
Rural hospital	1,033	14	14,467	173,599
Urban clinic	538	69	37,154	445,853
Total/average	3,163	3,384	984,178	11,810,135

Note: Number of health clinics from Government of Papua New Guinea (2010).

Determining how the new subsidy payments would be distributed is more problematic. Subsidy payments could be allocated evenly across clinics (as school subsidy payments are), but this would not take into account the widespread variation in fees collected across clinics. Since user fees are often very important for funding health facility operations, the resulting reduction in income for most clinics could well impact on the level of service provision. This could leave health facilities with a difficult decision to make: either provide fewer services or fail to comply. Both these options are clearly undesirable.

Alternatively, user fees currently raised could be taken into account using data similar to the PEPE health survey. However, this approach would disadvantage provinces that did not charge fees before 2014.

Finally, subsidy payments could be considered on a needs basis using cost of service and internal revenue estimates developed by the National Economic and Fiscal Commission (NEFC). This would follow a similar formula to function grant allocations, where poorer provinces with less internal revenue receive more funding. The problem with this approach is again that it would not be based on the current fees charged.

Each of these options has significant drawbacks in terms of finding an effective way to allocate subsidy payments across provinces. No matter which approach is taken, ensuring that some health clinics are not left with less funding as a result of the policy will be virtually impossible, even if the overall subsidy allocation is greatly increased.

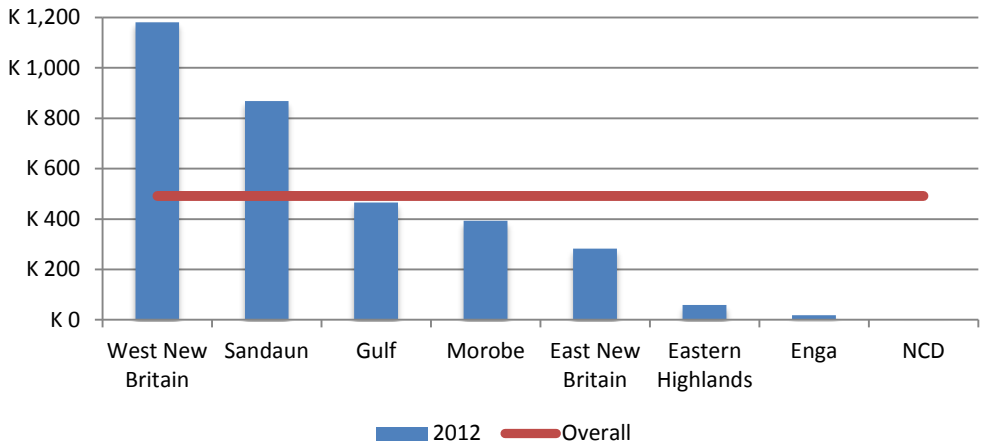
A key question for distributing subsidy payments is how to get funds to health clinics. Again, if the education model was used, the funds would be put into the clinic's bank account. However, the survey data reveals that only 44 per cent of clinics have bank accounts (Table 6-14).

Table 6-14: Health clinics with operational bank accounts (%)

	With bank account
Overall	44
	(2.8)
East New Britain	81
West New Britain	36
Morobe	42
Sandaun	44
Eastern Highlands	53
Enga	24
Gulf	26
NCD	13
Health centre	52
Aid post	33
Government	42
Church	44

Even if bank accounts were set up for every clinic, OICs would still have to access their funds. This could be expensive and inefficient. The magnitude of this challenge should not be underestimated, given the high costs of accessing financial services across PNG. The PEPE survey collected data on the total costs for health workers to access their pay and return to their posts. Since most health workers receive their pay directly into bank accounts, they need to access their pay at banks, ATMs or EFTPOS-type facilities. Figure 6-3 shows the average cost was about K490. There is enormous variation across provinces: the average cost is more than K1000 in Sandaun. And note that the costs of collecting school subsidy payments are more than double this level.

Figure 6-3: Average cost in kina to collect pay and return to post



Simply increasing subsidy payments for health clinics in a similar manner to schools under the Tuition Fee-Free policy is unlikely to be an appropriate short-term solution. Schools not only have bank accounts, which more than half of health clinics lack, they also have much better developed governance and supervision arrangements. Each school has a Board of Management (BoM), and, as Chapter 3 showed, it is influential, especially when it comes to finances. The health system is structured very differently. There are no BoMs and the OIC of the health facility is normally the best health practitioner at the clinic, rather than an experienced administrator (with the exception of large rural hospitals). While some health facilities have a Village Health Committee (VHC), these bear more resemblance to school P&C Committees, which represent community interests, rather than having a management or oversight role. Schools are also much more likely to receive supervisory visits than health clinics to monitor spending practices.

6.7 Conclusion

The health financing system in PNG does not provide reliable funding to health clinics to deliver services. Most clinics do not receive cash funding to meet expenses for their core operational activities and therefore need to collect fees or rely on in-kind support. Only 18 per cent of clinics reported receiving cash funding. 41 per cent had no access to any kind of external support (funding or in-kind) at all. These clinics are completely reliant on collecting user fees. 12 per cent of clinics neither charged fees nor had access to any external resources, and so simply had no means to cover any non-staff costs.

These results confirm the findings of earlier research. The District Case Study (DPLGA 2009) visited 25 health facilities in 2008/2009. It also showed that clinics experienced difficulties accessing funding and pointed to their reliance on user fees. This finding was confirmed by fieldwork reported in Sweeney and Mulou (2012) undertaken in 2009, which involved interviews at 44 health clinics, and by fieldwork

undertaken by the Monash Costing Study, also in 2009, based on some 50 health clinics (Inder et al. 2011).

What is striking about these new findings is not only that they are based on a much larger and nationally representative sample, but also that they come some three to four years later. In 2008, the health function grant was K14.5 million. In 2012, it was K64.4 million: about four times bigger. Recent NEFC reports have concluded that expenditure on front-line services, while still inadequate, has been growing (for example, NEFC 2012). A recent World Bank et al. (2013) report, based on a review of provincial expenditures, concludes that "there has been a real improvement since 2009 in the levels of funding and spending on frontline rural health services." (p. 11). However, as that study noted, these findings required further investigation by fieldwork to see whether increased expenditure was actually being translated into more and better services. What our fieldwork reveals is that whether there has or has not been an improvement, the situation is still far from satisfactory.

Our data suggests that the health function grant is not commonly used to fund budgets, but is kept at the provincial and district health office and, to the extent that it is directed to health clinics, is provided as in-kind support. But, even allowing for this, few resources seem to be reaching the frontline. Having 40 per cent of clinics with no external support at all, in cash or in-kind, is not a satisfactory situation. Given this lack of resources at clinics, it is not surprising that, as Chapter 4 showed, only a third of health clinics actually carried out maintenance of the clinic in 2012, or that just over a quarter of health centres conducted regular outreach patrols, or that only 36 per cent had adequate access to fuel to collect drugs. These three activities are part of the core priority services that the health function grant should fund to help enable health facilities to deliver these types of services.

What should be done? The PNG National Health Plan 2011-2020 acknowledges that "front-line service staff report [are] being impeded in their efforts by a lack of operational funds." (Government of PNG 2013). It calls for the introduction of a "direct facility funding" model whereby "allocated funding will be channelled directly to facility accounts." Such an approach is currently being trialled in Bougainville. Donor funding is being used to channel funds directly into health centre bank accounts, and health centre committees have been formed to help the OIC prepare budgets and manage expenditure. An evaluation of progress since 2011 (WHO and NDoH 2013) found that health centres receiving direct financing were able to deliver more health services, across a range of measures, than non-participating health centres in Bougainville.

This approach clearly has its merits, but also potential drawbacks. If mainstreamed, funds would still flow through provincial governments, and may be difficult to integrate into current financial arrangements. Many clinics do not have bank accounts, and would struggle to access

them once established. Establishing local oversight bodies would take a long time. Given the shortage of health workers, it is not clear that OICs should be given the additional burden of financial management.

A variant of this approach is direct funding to health clinics from the central government, that is, the application of the approach used by primary schools. Unlike with respect to primary schools, the central government is directing its funding to compensate clinics for the abolition of health charges through provincial governments, but, to avoid diversion or delays, it could start sending the funds directly to clinics. There will, once again, be issues at the clinic level (difficulties in accessing the funding, lack of oversight, staffing constraints), but the school subsidy experience suggests that the funding will at least reach the clinics' bank accounts.

A third model is that used by East New Britain. In this province, each health clinic is given a 'ring-fenced' entitlement in the provincial budget to a specific amount of funding from the health function grant. Some remote facilities receive a loading to account for the higher cost of services in their area, and health centres receive much more than aid posts due to their greater responsibilities. The funds are channeled to each of the province's 18 Local-Level Governments, and held in the relevant District Treasury on behalf of each facility. This is a 'facility budget allocation' model, rather than a 'direct-to-facility grant' model like PNG's system of school grants, because funds are not placed in a bank account operated by each facility.

It appears that East New Britain's system increases the flow of funds to each health facility. Facility staff access funds through their supervising Local-level Government. Over several years, the province has provided additional staffing, funding and infrastructure to its 18 LLGs, partly with a view to improve their ability to oversee the operation of health facilities. This includes LLG health manager positions, which appear to be unique to East New Britain. These officers are responsible for supporting specific clinics, so are able to work with the OIC to access funds according to the facility plan. This helps to ensure the clinic provides a comprehensive service to patients and that basic activities are conducted, such as regular maintenance, outreach patrols and drug collection. Given East New Britain's performance on health delivery, such a model warrants further investigation.

Further investigation of all of these approaches is required before a final recommendation is made. This will be undertaken as part of the second phase of this research project. What is clear at this stage is that there needs to be a shift to ensure that greater funding reaches clinics, putting flexible resources at their disposal.

This chapter has also revealed important differences between church and government-run clinics when it comes to financing. Church health clinics are no more likely to receive funding or in-kind support than government clinics but, if they do receive it, they receive much more:

almost eight times more for funding, and about four times as much for in-kind support. Chapter 9 considers the consequences of this increased funding for performance.

Whatever reform plans are put in place, in the short term the abolition of health user fees is going to make things worse, especially for the 30 per cent of health clinics that have no other source of finance for non-staff expenses. More generally, the survey responses suggest that user fees have become the most widely available, easily accessible and reliable source of funding for health facilities to use in the delivery of front-line services. For the reasons given in the previous section, it will be very difficult, if not impossible, to compensate clinics for the abolition of fees. While the intention of the policy is to improve access to services, its implementation will likely weaken, rather than strengthen, the health system.

Whether or not the free health care policy is reversed, the system of financial management in the primary health sector needs to be overhauled. Learning from approaches that seem to work and from pilots underway is probably the best way forward. Regular monitoring of the level of resources reaching health clinics will be crucial.

Chapter 6 Annex

Table 6-A1: Budget submissions and funding received by funding provider

	% budgets submitted	% budgets approved	Avg. total value of budget (K)	Avg. funding received of budget (K)	Month first funds received
By funding provider					
District Health Office	8	5	55,730	22,291	May
Provincial Health Office	4	2	59,250	11,000	May
LLG Health Officer	4	4	34,571	21,500	June
Church agency	4	4	155,285	132,300	-
Local politician	3	<1	10,000	0	April
Donor or NGO	2	<1	13,770	13,770	-
Referral health facility	1	<1	5000	0	May
Other	6	3	30,340	121,275	May

Table 6-A2: Health clinics that received direct funding without preparing a budget

Province	Agency type	Facility type	Funding provider	Amount received
Morobe	Lutheran	Rural Hospital	Lutheran health services	34,2000
Morobe	Government	Aid post	German health partnership	15,000
Morobe	Lutheran	Aid post	Local-level Government	20,000
Gulf	Other religious	Rural hospital	Tel investment – Oilsearch Ltd	128,000
Gulf	Catholic	Aid post	Catholic Health Services	1,200
East New Britain	United	SHC	United Church – Operation grant	10,000
Sandaun	Other religious	Health centre	DSIP	37,000
Enga	Catholic	Health centre	HIV/AIDS NGO	30,000
NCD	Government	Urban clinic	PNG Sustainable Development Program	60,000

Table 6-A3: Percentage of clinics assisted with administered support to carry out various activities in 2012

	Health outreach patrols to villages	Patient transfers to referral HC/hospital	Maintenance of health facility/ housing	Collecting or delivering drugs
Overall	82	34	28	47
East New Britain	91	45	27	64
West New Britain	71	29	0	57
Morobe	78	33	44	44
Sandaun	100	33	33	33
Eastern Highlands	100	17	33	33
Enga	75	50	0	50
Gulf	79	43	21	71
NCD	40	20	20	60
Health centre	92	51	40	60
Aid post	75	9	7	33
Government	88	35	23	48
Church	73	32	34	38

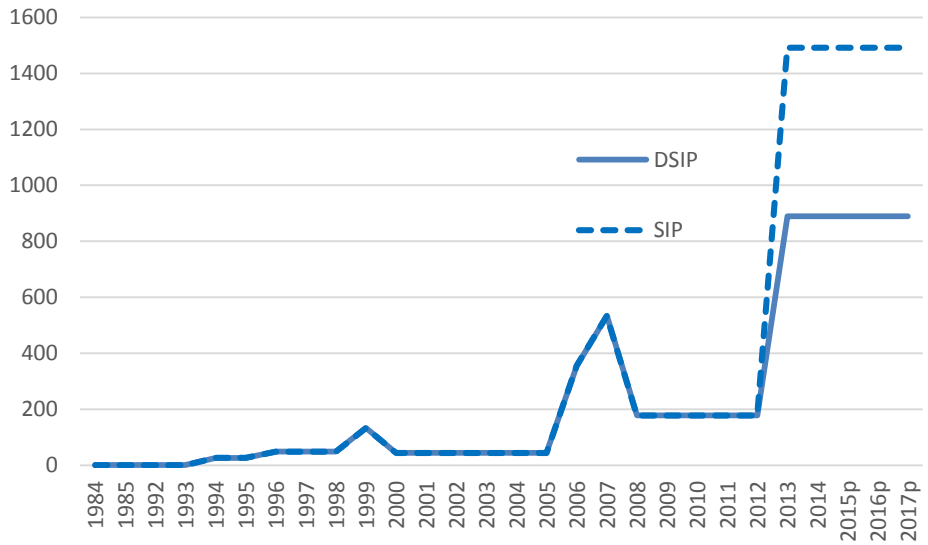
7 DSIP: ARE HEALTH AND EDUCATION BENEFITTING?

7.1 MP development funding: an overview

Since the 1980s, PNG MPs have received funding to spend in their electorate, initially through the Electoral Development Fund and, more recently, through the District Services Improvement Program (DSIP).

Figure 7-1 shows the huge increases in these programs over the last decade and in the 2013 budget. In the 2013 budget (and again in the 2014 budget) PNG's 89 open electorates (normally made up of one or two districts) were allocated K10 million each, more than double the previous average annual allocations from 2007-12. Although our survey occurred before this increase, the fact that DSIP has become so much more important only makes its study more important.

Figure 7-1: The rise of constituency funding in PNG (Kina million)

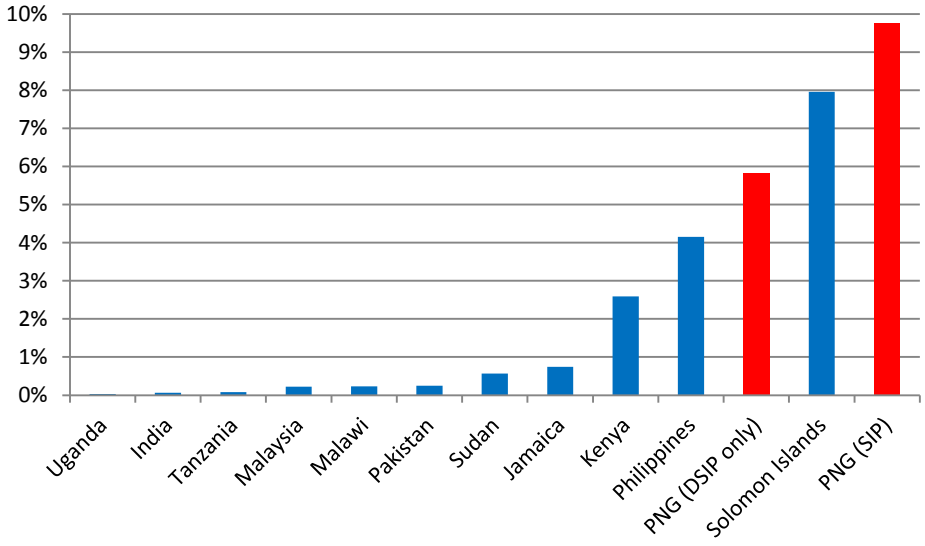


Note: DSIP: Electoral Development Fund from 1984-2005 and DSIP thereafter. SIP includes PSIP and LLGSIP funds as well. 2013 and 2014 are budget figures. 2015 onwards are projected figures. Sources: Ketan (2007), IMF (2013) and budget documents.

It is not only the DSIP that has increased. In 2013, K500,000 was also allocated to each Local Level Government (LLG) through the LLGSIP: there are normally about three or four LLGs per open electorate. And provinces have been given K5 million per open electorate in each province through the new Provincial Services Improvement Program (PSIP). Adding these sums to the DSIP gives an amount of K1,490 million for these programs every year from 2013 onwards under a combined Services Improvement Program (SIP). The PSIP alone (K445) is more than the amount that the provinces receive through functional grants (K398 million in 2013).

Indeed, PNG seems to rely more heavily on constituency funding to disburse its budget than any other government in the world (Figure 7-2). Many countries have constituency funds, but they are typically just a few percentage points or less of government spending. In PNG, they are 6 per cent if counting only the DSIP and almost 10 per cent if counting the PSIP and LLG funding as well.

Figure 7-2: Ratio of constituency funding to total budget spending: a cross-country comparison



Notes: 2009 data except for Solomon Islands (2013) and PNG (2014). See Figure 7-1 for the difference between DSIP and PSIP. Sources: Hickey (2010); World DataBank; IMF (2013); PNG national budget documents.

The governance arrangements in place for these three funds put decision making in the hands of committees in which politicians have significant influence in decisions on spending.

The Joint District Planning Budget Priorities Committee (JDPBPC) is the decision-making body for the DSIP. It is chaired by the MP of the district (or electorate) and also includes LLG presidents and community members. The District Administrator is the CEO of the JDPBPC. District officials are responsible for informing schools and health facilities about allocations made, as well as implementation plans.

The PSIP is managed through the Joint Provincial Planning Budget Priority Committee (JPPBPC), which is normally chaired by governors of the provinces, and also includes constituency or open MPs.

The LLG Services Improvement Program (LLGSIP) is supposed to be implemented through the JDPBPC rather than the LLG Assembly, since there are no clearly established mechanisms for development spending at the LLG level.

Although MPs clearly have a lot of say in how these funds will be spent, the PNG Government is clear that SIP funding is not for MPs to spend

as they like, but rather to finance infrastructure, including to improve service delivery. According to administrative guidelines for spending SIP funds (DIRD 2013), 40 per cent of funding under all three programs is meant to be spent on 'health services improvement' and 'education services improvement' (20 per cent each). This equates to 40 per cent of K1.5 billion, or about K700 million a year. This is a huge amount: it is more than four times the amount that provinces receive through their function grants for health and education (K150 million).

Media reports give conflicting accounts, ranging from well-planned and executed projects to allegations of cash payments. This has made it difficult to judge the overall effectiveness of DSIP spending as a whole. Indeed, given its decentralised and dispersed nature, evaluating the quality of spending under the DSIP across PNG would be a difficult undertaking. Whether DSIP is an extension of direct payments to MPs to be used as a personal slush fund, a genuine service delivery program or something in-between is debatable. What cannot be denied is its growing importance.

The PEPE survey was certainly not an evaluation of the DSIP. However, it did ask some questions about funding allocations and the implementation of projects benefiting schools and health clinics. Both surveys asked the same questions to the Officers in Charge (OIC) of the surveyed health clinics and the Head Teachers of the surveyed schools. This chapter reports the answers they gave to the questions we asked them about the DSIP.

In summary, the chapter shows that there is little funding from the DSIP reaching primary schools and health clinics, that the scheme is seen as unfair by Head Teachers and OICs, and that a significant number of projects are not only behind schedule but may never be finished.

7.2 DSIP project allocations

Based on the survey responses, schools are more likely than health clinics to receive a DSIP project. Respondents were asked if their facility had ever been the beneficiary of a DSIP-funded project. 20 per cent of schools said they had, and 12 per cent of health clinics (Table 7-1). Among health clinics, aid posts miss out on the DSIP. Only 3 per cent of aid posts, but 23 per cent of health centres, reported ever receiving a DSIP project. So, schools and health centres are about equally likely to receive a DSIP project.

Most schools (62 per cent) received funding directly into their bank account for their project. But most health clinics (75 per cent) received the project in-kind: that is, someone else arranged for the project's implementation, for example, the district or provincial administration. This reflects the much more developed financial management practices at schools than at health clinics, discussed in Chapters 6 and 7. For

example, only 44 per cent of health clinics have a bank account, whereas almost all schools do.

Although health clinics are less likely to receive DSIP funding, if they do get a project it is likely to be more expensive. The average DSIP project size for recipient health clinics was K92,000; the average for primary schools was K64,568, one-third less.

We did not formally record which projects the DSIP funding was used for, but it was evident that DSIP projects were mainly for building new classrooms, health clinic buildings or houses for staff.

Table 7-1: DSIP project prevalence and value: provincial and agency breakdowns

	DSIP project received (%)		Value DSIP project (K)	
	Schools	Health clinics	Schools	Health clinics
Overall	20	12	64,568	92,000
Government	18	15	85,408	91,583
Church	23	9	14,480	92,833
Health centre +	NA	23	NA	103,286
Aid post	NA	3	NA	52,500
Received in cash/bank account	62	25		
Received as in-kind project	38	75		

Notes: Weighting was not undertaken for the provincial health clinic figures and the aid post figures due to the small number of observations. The value of projects was averaged over those facilities that received a DSIP project. NCD officials did not estimate the value of their DSIP projects.

Only 38 per cent of schools and 26 per cent of health clinics believe that the DSIP is a fair system. Both Head Teachers and Officers in Charge agree they should be able to apply for funding directly, rather than the JDPBPC making decisions based on their own priorities.

Table 7-2: Perceptions of DSIP fairness and application process (%)

	Schools	Health clinics
DSIP is a fair system	38	26
They should be able to apply for funding	64	69

7.3 DSIP project implementation and completion

DSIP projects are mainly delivered through private contractors, district administrations or by the facilities themselves (Table 7-3). Private contractors implement most health projects (57 per cent), but schools are much more likely to implement their own projects (45 per cent). This probably reflects the fact that schools have more autonomy and capacity to manage their own projects. It may also be that school projects are simpler, as well as less expensive.

Table 7-3: DSIP implementation modalities (%)

	Schools	Health clinics
DSIP project implementation by:		
Facility	45	14
Private contractor	14	57
District administration	25	22
Another process	16	7

Note: Percentage of those facilities that report a DSIP project.

For health clinics, only one-third of DSIP projects were completed in full and on time (Table 7-4). Schools did much better, with almost two-thirds of projects completed in full and on time. For both types of facility, projects that were behind schedule were seriously delayed (by about a year on average). In fact, respondents thought that about 40-45 per cent of projects that were delayed would never be finished. This means that 31 per cent of all DSIP health projects are forecast never to be finished, and 16 per cent of all DSIP school projects.

Table 7-4: DSIP completion rates and implementation delays

	Schools	Health clinics
DSIP project completed in full and on time (%)	65	32
If not completed in full and on time…		
months project is behind schedule	12	11
project will never be completed (%)	41	45

It should also be borne in mind that completion does not mean utilisation. We did not formally ask this in the survey, but the experience of coming across a brand-new but yet-to-open health centre in Gulf Province was striking. We were told that basic construction had been completed more than 12 months ago, but that the clinic could not be opened due to a dispute between government and church health officials about ownership of the health facility and who would be responsible for finding a health worker to take up the vacant post at the centre.

A new, but unopened health clinic built in Gulf Province with funding from the District Service Improvement Program.

7.4 Conclusion

There are many arguments about the DSIP and whether it is a good use of public funds, but it seems certain to stay. Not only is the government committed to maintaining a very high level of public expenditure going to DSIP and similar funds. Recent legislative moves indicate a desire to effect bureaucratic change to expand capacity at the district level and consolidate the local decision-making power of MPs.

The District Development Authorities Bill was introduced into the PNG Parliament in late 2013. The District Development Authority will replace the JDPBPC, which is currently the decision maker concerning the DSIP. All public servants in the district, including police, teachers and health workers are proposed to come under the District Development Authority, the CEO of which will be the District Administrator. The Members of Parliament that represent open district electorates and hold 89 of the 111 seats in the National Parliament (commonly referred to as Open MPs) will be the Chair of their respective District Development Authority, giving them greater influence over funding allocations and human resources.

Given all this, it is important to learn what we can from the functioning of the DSIP to date. What can we conclude from this study?

First, not a lot of funding seems to be flowing from the DSIP to PNG's schools and health facilities. If we take the average amount going to schools and health centres, and multiply this by the total number of each, the complete value of cumulative DSIP funding as of 2012 to primary schools is K46.2 million and to health facilities is K37.6 million, with a total of K83.8 million. This is 23 per cent of a single year's allocation of the DSIP prior to the 2013 increases. But we asked facilities if they had *ever* received a DSIP-funded project. The projects reported could have been funded out of several years' allocations. If they were funded out of four allocations, then the percentage flowing to primary health and education falls to just 6 per cent. This is just a rough estimate, but it does suggest that little from the DSIP is making its way to PNG's schools and health clinics.

Clearly, the increased funding should make a difference. If the same share of DSIP funding continues to go to health and education then, after a few years, we can expect the inflow to primary health facilities and schools to increase fourfold to K352 million. But if health and education get their regulated share, then the stock of projects underway at any one time should be at least double that (allowing some funding to flow to secondary schools and hospitals).

We cannot say whether health and education are getting so little because other sectors are getting a lot more or because of waste and corruption. But it is clearly in the interests of individual schools and health facilities, as well as their national departments, to lobby for more funding.

Second, there is general dissatisfaction with the fairness of how the DSIP projects are allocated. Reforms should be considered to allow schools and health facilities to bid directly for projects, and rules should be developed to allow all facilities to access funding periodically.

Third, projects are often either significantly behind schedule or never completed. About 30 per cent of all the DSIP health projects and 16 per cent of all the education projects are forecast never to be finished. Two-thirds of the health projects and one-third of the education projects are a year behind schedule. Poor spending and delays with implementation can be damaging for the reputation of the DSIP at the local level, and of course are bad for value for money.

Fourth, we once again see a difference between the health sector and the education sector. Education projects are almost twice as likely to be finished on time. Schools are much more likely to receive funding in cash, and to be in charge of the projects themselves. Perhaps this makes it easier to run a successful DSIP project? More generally, it is likely that the better developed governance structures at schools mean that their projects are more likely to succeed.

Fourth, projects may be completed but not used. There is clear evidence from our survey of the need for new and rehabilitated infrastructure in most provinces, from run-down health clinics to dilapidated teachers' housing. The DSIP has been, and continues to be, the main funding source that can finance these types of projects. The relative capacity of provinces to ensure contractors are monitored and projects are completed on time is widely variable, but important to ensuring effective spending. The focus should be on maintenance and replacement, not the construction of new, additional assets. MPs and administrators should coordinate closely to ensure that new facilities are not left idle, or, put differently, that construction is only undertaken where staff are available to make use of the facilities being built.

PART FOUR:
EXPLAINING THE RESULTS

8 FACILITY LEVEL EXPLANATIONS OF PERFORMANCE

8.1 Introduction

The statistics presented in Chapters 3 to 7 have aimed to summarise important characteristics at the facility level. The averages presented in the tables and charts have enabled comparisons of average facility performance across points in time, facility types, province, and agency. They have shown many interesting differences. We have attempted throughout the report to explain these differences. For example, it seems likely that schools have fared better than health clinics over the last decade because they have been better financed, better governed, and better staffed.

But to get a better understanding we need to go beyond averages. The objective of this section is to relate facility characteristics to performance outcomes and test these relationships through regression analysis. This approach can not only identify facility level explanations of performance but can also quantify the marginal impact of variations of facility inputs on performance outcomes.

The findings for schools indicate that while location and funding is important, good performance is strongly associated with indicators of the quality of management and level of management effort at the school level. These characteristics are in turn dependent on the extent of formal oversight by Standards Officers and informal oversight by the school community. The main finding for health clinics is that revenue from user fees and support from health funding providers are key inputs to achieving good performance outcomes across a range of measures. The result highlights the importance of good financial management at health clinics, in particular collecting and managing user fees, an ability to source financing and support from funding providers, and a desire to use these resources to undertake key activities at the clinic.

8.2 Methodology

Regression analysis involves identifying variables of interest that are outputs or outcomes (dependent variables) and relating each of these measures to a set of explanatory variables. In a linear regression, the dependent variable is linearly related to the explanatory variables and a residual.[16] Linear regression analysis or Ordinary Least Squares (OLS) will estimate a coefficient on each of the explanatory variables

16. The residuals measures the difference between an observation of the dependent variable and the model's predicted value for that observation based on the estimated linear equation over the explanatory variables.

specified in the regression in order to minimise the sum of the squared residuals.

Under specific conditions, the regression estimates are unbiased and the analysis allows for estimation of a causal relationship between explanatory variables and the dependent variable. In the case of linear regressions, the coefficient on an explanatory variable measures the estimated impact of a unit increase in that explanatory variable on the dependent variable (measured in units of the dependent variable). For example, the dependent variable could be the percentage of classrooms constructed of permanent materials (the performance measure) and one of the explanatory variables could be the number of hours travel from the school to the nearest trade store; under unbiased estimation the coefficient on this explanatory variable measures the estimated percentage point change in the share of classrooms made of permanent materials resulting from an additional hour's travel time to the nearest trade store.

An explanatory variable is typically identified as an important determinant of the dependent variable when its estimated coefficient is assessed to be statistically different from zero; for this to occur the estimated coefficient needs to be large relative to its standard error, a measure of how well the model estimates the coefficient's unknown value.

In practice, the extent to which conditions hold for unbiased estimation vary substantially. Care needs to be taken to interpret the results from regression analysis, particularly when there is potential for reverse causality, that is, when the explanatory variables are influenced by the dependent variable. When explanatory variables are endogenously determined (such as when reverse causality occurs) the estimated coefficients will be biased and will not reflect a true causal relationship running from the explanatory variable to the dependent variable. When reverse causality is thought to occur the regression results are best interpreted as identifying correlates between variables rather than a causal relationship. Nonetheless, identifying correlations between variable of interest is a useful first-step in the process for identifying causal relationships. The approach for selecting explanatory variables in this section is based on a priori reasoning which reduces the potential for reverse causation.

For reasons of simplicity and ease of interpretation of results, all regressions in this section are estimated linearly.[17] For both school and health clinic regressions, the regression equations are estimated in levels, that is, the level of the dependent variable is regressed against measures of the level of explanatory variables. A potential issue with estimation in levels is that it is difficult to include all important explanatory variables in the regression equation. The problem of

17. Non-linear regression methods such as probit or logit regressions for binomial dependent variables are able to produce more precise model estimates but are not used here because the results are harder to interpret, particularly in the case of panel regressions.

omitted variable bias occurs when important explanatory variables are omitted from the regression equation which are correlated with other explanatory variables; in this case the estimates on the correlated variables will be over or under estimated in order to compensate for the omitted variable.

For health clinics, insufficient data was collected in 2002 for the purpose of regression analysis, and we only report results using the 2012 PEPE data. For schools, however, enough similar data was collected in both 2002 and 2012 to allow us to use both surveys. We do this in two ways. First, we simply pool the 2002 and 2012 data. Second, we report results from regressions in first-differences (that is, in terms of the change in variables over time). Estimation in first-differences is numerically equivalent to fixed-effects estimation in the case of two time periods. This is useful because in many cases omitted variables are specific characteristics of the unit of observation (in this case schools or health facilities) which do not change over time. Fixed-effect estimation on panel data eliminates their impact. On the other hand, fixed-effect estimates are less likely to tell us whether factors that are time invariant influence performance, such as whether the school or health clinic is church- or government-run.

The regressions are unweighted. Instead, control variables, such as facility type, agency and location, are used as explanatory variables in the regressions to account for the characteristics of the sample. While a number of explanatory variables are specified in each regression, the regression results presented in tables in this chapter contain only those variables with estimates that are statistically significant.

8.3 Performance measures

The dependent variables for schools and health facilities relate to facility level measures of the condition and provision of infrastructure, the provision of resources and equipment, management performance, and quality and quantity of outputs.

Education

The dependent variables (performance outcomes) used in the school regressions and their summary statistics are presented in Table 8-1; the levels of the dependent variables are shown for 2012 and 2002/2001 (some variables in the PESD survey are 2002 measures based on when the survey was undertaken and others are based on 2001 full year measures), and the change in the dependent variables within schools across the two time periods are shown the columns under the Change heading. The number of observations for the change in the dependent variables differs from the number of observations of the variables measured in levels due to missing observations and some schools not matching across the two time periods. Variables with (0/1) in the table are binomial and take a value of either zero or one (for

example, a value of 1 for DRINK WATER ALL YEAR indicates that drinking water was available at the school for the entire year and a value of zero indicates that drinking water was not available for the entire year).

Table 8-1: Summary statistics of dependent variables for school regressions

	2012			2002/2001			Change		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Infrastructure variables									
PERMANENT CLASSROOMS (%)	216	73.0	32.7	198	63.4	38.1	162	7.8*	37.0
GOOD CLASSROOMS (%)	216	26.7	30.7	198	29.2	34.5	162	-4.4	41.3
PERMANENT TEACHER HOUSES (%)	216	57.6	37.3	206	48.4	41.6	153	8.8*	31.3
GOOD TEACHER HOUSES (%)	216	20.8	28.0	205	18.1	26.9	152	2.5	37.6
CLASSROOMS THAT DON'T LEAK (%)	216	65.2	27.8	197	62.4	33.9	161	1.0	42.2
DRINK WATER ALL YEAR (0/1)	214	72.4	44.8	190	58.3	49.2	154	10.3*	64.6
ENOUGH TOILETS (0/1)	214	55.1	49.9	181	52.9	50.1	151	9.4*	70.2
INFRASTRUCTURE INDEX (%)	216	59.7	21.0	199	53.8	18.0	163	5.2*	23.6
Resources variables									
SUFFICIENT TEXTBOOKS (0/1)	203	31.1	43.5	175	24.1	43.5	146	0.0	64.6
PRODUCE TEACHING AIDS (0/1)	203	77.8	40.4	175	79.2	40.4	146	-1.2	56.2
TEACHERS WORKING TO TEACHING POSITIONS (%)	214	90.4	34.0	197	79.5	23.7	163	5.7*	37.5
Management variables									
BOM EFFECTIVE (0/1)	196	67.3	47.1	196	76.5	42.8	139	-6.6	61.0
TEACHERS ON TIME (0/1)	212	59.4	49.2	203	69.4	46.3	160	-5.4	63.8
TEACHERS SPEND TIME TEACHING (0/1)	211	65.1	47.8	204	69.2	46.2	160	-1.2	62.1
Output variables									
STUDENTS PRESENT (%)	201	70.8	31.9	175	84.0	17.4	136	-15.5*	35.7
CHILDREN ATTEND SCHOOL (0/1)	212	70.0	45.9	204	62.3	48.4	162	11.9*	65.3

Notes: * indicates the value is significantly different from zero at the 10% level (only applied to the mean change). Variables with (0/1) refer to binomial variables that take a value of zero or one (means are reported in per cent). All data are weighted (the data in the Change columns are based on 2012 weights). GOOD CLASSROOMS and GOOD TEACHERS HOUSES are classrooms and houses that do not need rebuilding or maintenance, respectively. STUDENTS PRESENT is measured as the share of students in the Grade 5 teacher's home class present at the time of the survey out of total students in the home class. CHILDREN ATTEND SCHOOL equals one if the Grade 5 teacher reports that most or all children of school age in the community attend school, and zero otherwise.

The share of classrooms (PERMANENT CLASSROOMS) and teachers' houses (PERMANENT TEACHER HOUSES) made of permanent materials both increased over the two periods, an average change of around 8 and 9 per cent, respectively. These mean changes along with the average change in DRINK WATER ALL YEAR, ENOUGH TOILETS and INFRASTRUCTURE INDEX were all statistically different from zero. ENOUGH TOILETS takes a value of one when the Head Teacher reports that there are sufficient toilets for males and females at the school. The variable INFRASTRUCTURE INDEX takes a value between zero and one and is the simple average of seven binomial measures of infrastructure provision (provision of a library, staffroom, administration block, sports area, sports equipment, school vehicle, and school agricultural area). The mean change in all of the other infrastructure related variables were not statistically different from zero. GOOD CLASSROOMS and GOOD TEACHER HOUSES are

variables that measure the share of classrooms and houses that do not need to be rebuilt or require significant maintenance work. CLASSROOMS THAT DON'T LEAK measures the share of classrooms that don't leak when it rains.

SUFFICIENT TEXTBOOKS and PRODUCE TEACHING AIDS equal one when a Grade 5 teacher reports that there were sufficient textbooks at the school for Grade 5 students and an ability to produce teaching aids for the classroom, respectively. TEACHERS WORKING TO TEACHING POSITIONS measures the ratio of the number of teachers regularly working to the number of teaching positions at the school and captures the ability of the school to fill teaching positions. Only the mean change in TEACHERS WORKING TO TEACHING POSITIONS (an increase of nearly six percentage points) was statistically different from zero among the school resources performance measures.

The measures on school management outcomes were based on P&C representative/parent perceptions; the mean change for all of these variables was not significantly different from zero. BOM EFFECTIVE, TEACHERS ON TIME and TEACHERS SPEND TIME TEACHING take a value of one when parents rate BoM management as effective, teachers are often or always on time, and when teachers often or always spend time at school teaching, respectively. The change in each of these variables was not statistically different from zero between the two periods.

The measures of school output were limited to STUDENTS PRESENT, measured as the number of students in the Grade 5 teacher's home-class present at the time of the survey divided by total enrolled students in the home-class, and CHILDREN ATTEND SCHOOL which takes a value of 1 if P&C representatives / parents reported that most or all children of school age in the community attended school. There was a significant decrease in STUDENTS PRESENT over the decade; the increase in the number of students present at schools was not able to keep pace with the increase in enrolments at schools. In contrast, there was a significant increase in CHILDREN ATTEND SCHOOL which indicates improvement in access to schooling in communities, despite attendance not being as high as it could be due to the decrease in STUDENTS PRESENT.[18]

Health

As noted above, the regression analysis for health clinics is based on 2012 data from the PEPE survey only due to the limited range of variables measured in the PESD survey. For this reason all the regressions are specified in levels. Summary statistics of dependent (or

18. Neither the PEPE nor PESD surveys collected data on the number of children of school age across school catchment areas which meant that enrolment rates could not be used in the regression analysis.

performance) variables for health clinic regressions are presented in Table 8-2.

Similar to the school measures, the infrastructure variables measure the condition, construction, and provision of health clinic fixed assets. The variable CLINIC INFRASTRUCTURE INDEX is calculated as the simple average of four binomial measures of good or adequate provision of infrastructure at facilities (health clinic vehicle, kitchen, beds and mattresses, and patient waiting room).

Table 8-2: Summary statistics of dependent variables for health clinic regressions

Dependent variables	N	Mean	SD
Infrastructure variables			
GOOD CLINIC ROOMS (%)	136	27.8	37.0
PERMANENT WORKER HOUSES (%)	110	74.8	38.1
GOOD WORKER HOUSES (%)	108	25.1	38.8
CLINIC ROOMS THAT DON'T LEAK (%)	138	68.1	37.5
ENOUGH TOILETS (0/1)	137	51.2	50.2
CLINIC INFRASTRUCTURE INDEX (%)	142	25.8	31.5
Resources variables			
WATER ACCESS (0/1)	139	50.4	50.4
REFRIGERATION (0/1)	139	41.4	49.9
FUEL AVAILABLE (0/1)	139	63.8	48.3
ZERO DOCTOR VISITS (0/1)	142	88.5	32.6
WORKERS TO CLINIC POSITIONS	137	80.9	25.2
DRUG AVAILABILITY INDEX	142	60.4	20.6
Management variables			
WORKERS AT CLINIC (0/1)	137	73.5	44.4
STAFFING PROBLEMS (0/1)	139	29.5	45.8
PATIENTS SEEN ON ARRIVAL (0/1)	138	88.5	32.0
FUNDING PROBLEMS (0/1)	139	39.3	49.1
Output variables			
HEALTH PATROLS	136	9.3	29.4
HEALTH PATROLS GREATER THAN 10 (0/1)	142	11.5	32.0
COMMUNITY HEALTH PROMOTION (0/1)	137	72.2	45.2
MEETS COMMUNITY NEEDS (0/1)	137	75.9	43.6
TRANSFER PATIENTS (0/1)	142	81.8	38.8
SERVICE QUALITY PROBLEMS (0/1)	139	39.6	49.5

Notes: Weighted data for 2012. Variables with (0/1) refer to binomial variables that take a value of zero or one (means are reported in per cent). GOOD CLINIC ROOMS and GOOD WORKER HOUSES are buildings that do not need rebuilding or maintenance.

The DRUG INDEX variable within the resources category is calculated as the simple average over 16 binomial variables that measure the

availability of important drugs and medical supplies.[19] WATER ACCESS, FUEL AVAILABLE, REFRIGERATION and ZERO DOCTOR VISITS are all binomial variables that take a value of one when there was water access on the day of the survey, the OIC reported having fuel for transport most or all of the time, the clinic has refrigeration facilities for drug storage, and a doctor did not visit the clinic in 2012, respectively. The variable WORKERS TO CLINIC POSITIONS is measured as the ratio of the number of workers who regularly turn up at the clinic to the number of designated worker positions at the clinic.

Management-related performance measures include whether workers were at the clinic often or all of the time (WORKERS AT CLINIC), and whether a user of the clinic reported that they were seen on arrival to the clinic (PATIENTS SEEN ON ARRIVAL), or there were staffing issues (STAFFING PROBLEMS) or problems with funding at the clinic (FUNDING PROBLEMS).

The output-related variables measure a range of key activities at health facilities: health patrols, health promotion in the community (COMMUNITY HEALTH PROMOTION), and an ability to transfer patients to receive specific health care (TRANSFER PATIENTS). Health patrol variables measure the number of patrols in 2012 (NUMBER OF HEALTH PATROLS) and whether the clinic conducted more than 10 health patrols in 2012 (HEALTH PATROLS GREATER THAN 10), the latter an important indicator of whether the clinic is able to provide regular health care and immunisations to the surrounding community. Two other output measures are based on user perceptions of the clinic: whether the clinic meets the health care needs of the community (MEETS COMMUNITY NEEDS) and whether there are service quality problems at the clinic (SERVICE QUALITY PROBLEMS). A difficulty that precluded the analysis of the number of patients or patients per worker was the inability to control for the catchment size and prevalence of health problems in local communities, as well as the heterogeneity of treatment types across facilities.

8.4 Explanatory variables

The explanatory variables for school and health clinic regressions are broadly categorised by clinic type and location, management characteristics, supervision characteristics, measures of community interaction, and measures of clinic resources. A number of the explanatory variables are binomial dummy variables (either taking a value of zero or one), such as whether school agency is GOVERNMENT (0/1), CHURCH (0/1), or PRIVATE (0/1). In general a regression cannot include all of these dummy variables due to perfect multicolinearity; one of the dummies must be left out (except when the regression is specified without a constant term) and the estimated coefficients on

19. These are Panadol, fansidar, TB blister packs, condoms, liniment, depo-provera, measles vaccine, ergometrine, oral rehydration solution, oxygen, amoxicillin tablets, chloroquine, baby books, pregnancy tests, malaria – rapid diagnostic testing, and mala-wan.

the dummies included in the regression are interpreted as values relative to the coefficient on the dummy variable omitted from the regression.

Education

Summary statistics of explanatory variables for school regressions are presented in Table 8-3. The data indicate that there was a significant increase in schools upgrading from community to primary school status over time. Slightly less than 60 per cent of schools in the PEPE and PESD samples are government, with the remainder mostly consisting of church run schools. The REMOTENESS INDEX variable is measured in hours and is calculated as the simple average over the travel time from each school to the nearest health clinic, police station, trade store, commercial bank and provincial capital as reported by the Head Teacher. The increase in REMOTENESS INDEX over time is significantly different from zero and in large part reflects the loss of banking services in Gulf Province and the closure of the airstrip in Pomio District.

None of the mean changes in Head Teacher specific variables were significantly different from zero. For the Board of Management (BoM) variables, the average change in the share of parents on the BoM increased but the share of female representatives on the BoM decreased. The variables BOM MOST SAY - CLASSROOMS and BOM MOST SAY - MAINTENANCE take a value of one if the Head Teacher of the school reported that the BoM had the most say in making decisions on building classrooms and undertaking school maintenance activities, respectively, and zero otherwise. There was a significant decrease in BOM MOST SAY – MAINTENANCE over the two periods and the change in number of BoM meetings (BOM MEETINGS) and BOM MOST SAY – CLASSROOMS were not significantly different from zero.

While the average change in the number of Standards Officer (SO) visits to schools (SO VISITS) was not significant, Head Teachers on average reported a significant decline in SO visits that did not result in a written report provided by the SO to the school during or following a visit (SO NO REPORT). There was also a significant increase in SO visits in which the SO observed classes (SO OBSERVED CLASSES) and checked school records (SO CHECKED SCHOOL RECORDS).

Table 8-3: Summary statistics of explanatory variables for school regressions

	2012			2002/2001			Change		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Type and location									
COMMUNITY SCHOOL (0/1)	216	12.5	33	206	63.5	49.2	167	-44.5*	51.7
CHURCH (0/1)	216	38.4	49	201	43.8	51.0	167	-6.5*	40.5
PRIVATE (0/1)	216	3.2	17	201	1.7	13.3	167	-0.1	16.7
REMOTENESS INDEX (HOURS)	214	3.5	6	185	3.0	4.1	151	0.7*	3.8
Head Teacher									
FEMALE HT (0/1)	215	17.9	39	199	12.8	33.6	164	4.0	52.6
NUMBER OF YEARS HT	216	3.1	3	171	2.9	2.9	138	0.1	4.7
BORN IN PROVINCE HT (0/1)	216	69.9	46	198	71.6	45.7	163	1.1	63.6
BOM									
BOM MEETINGS	213	4.0	2	179	4.0	2.2	140	0.2	3.5
BOM PARENT (%)	215	38.2	24	199	31.9	22.4	163	6.1*	29.1
BOM FEMALE (%)	215	22.0	17	199	22.8	14.2	163	-3.0*	21.0
BOM MOST SAY - CLASSROOMS (0/1)	214	64.4	44	198	74.6	43.7	161	-7.1	61.3
BOM MOST SAY - MAINTENANCE (0/1)	215	68.5	47	198	75.0	43.4	162	-9.2*	64.7
Standards Officer									
SO VISITS	216	1.2	1	179	1.3	1.4	146	-0.1	1.8
SO NO REPORT (0/1)	216	20.2	40	171	35.3	48.0	143	-19.3*	59.2
SO OBSERVED CLASSES (0/1)	201	62.2	49	174	57.8	49.6	136	11.5*	70.6
SO CHECKED RECORDS (0/1)	201	68.2	47	168	56.0	49.8	133	20.9*	63.2
Community interaction									
P&C MEETINGS	199	3.9	5	189	3.7	5.4	126	0.3	6.2
HT MIXES WITH COMMUNITY (0/1)	207	48.5	50	197	45.5	50.0	152	9.0	72.5
SCHOOL INVITES COMMUNITY (0/1)	205	83.6	37	199	51.6	50.1	152	32.9*	56.2
Resources									
REVENUE PER STUDENT	183	307.6	172	89	163.6	132.6	69	153.2*	153.9
LOWER SCHOOL FEE	216	7.7	22	189	24.2	36.5	157	-20.5*	41.7
LOWER PROJECT FEE	198	23.7	33	193	36.6	38.3	145	-13.3*	45.4

Notes: * indicates the value is significantly different from zero at the 10% level (only applied to the mean change). Variables with (0/1) refer to binomial variables that take a value of zero or one (mean and standard deviation are reported in per cent). All data are weighted (the data in the Change columns are based on 2012 weights).

The average change in the number of P&C meetings at schools (P&C MEETINGS) was not significantly different from zero. Similarly, there was no significant change in the prevalence of the Head Teacher often mixing with the community (HT MIXES WITH COMMUNITY) as reported by the P&C/parents. However, there was a 32 percentage point improvement (significantly different from zero) in the prevalence of schools inviting the community to participate in preparing programs at the school (SCHOOL INVITES COMMUNITY). For school resources variables, revenue per student increased by around K128 in real terms, despite an average real reduction in school fees (charged to lower primary students) of around K19 and an average real reduction in project fees (charged to lower primary students) of around K8.[20]

20. Lower primary school and project fees are used here due to the high proportion of community schools in the 2002 PESD survey, which did not have grades in the upper primary school level.

Instead, real funding increases to schools were driven by increased school subsidy payments from the national government.

All of the level regressions include dummy variables for each province (no constant term is estimated in the regressions).

Health

Summary statistics of explanatory variables for health clinic regressions are presented in Table 8-4. Health clinic types are broken down into two categories: aid post and health centre plus (40 and 60 per cent of observations, respectively). The latter category consists of health centres, sub-health centres, district health centres, rural hospitals, and urban clinics. Church, private and government clinics represent 37, 6, and 57 per cent of observations in the sample, respectively.

The variable CLINIC REMOTENESS INDEX is calculated as the simple average of six measures of travel time in hours from the health clinic to various infrastructure and service access points (the provincial capital, an operating road that can be accessed by 4x4 vehicles, the nearest bank, the nearest trade store, the nearest commercial source of drugs, and the nearest referral health centre or hospital). The variable CLINIC SIZE is a control variable for the size of the clinic and is measured by the number of patients treated at the clinic in a typical day.

The management related variables capture basic characteristics of the OIC (FEMALE OIC, NUMBER OF YEARS OIC and BORN IN DISTRICT OIC). The variables prefixed by USER FEES and OWN BUDGET equal one when the clinic normally meets expenses for various common activities through user fees revenue and the clinic budget, respectively. These variables equal zero when the activities are funded by other means such as requests to other institutions (district administration, provincial administration, church, and private companies) or health workers, or when the activities are not provided by the health clinic. USER FEES and OWN BUDGET are categorised as management variables as they capture whether the clinic chooses to use discretionary funds to pay for drugs, fuel, and patient transfers.

The resources related variables include USER FEES RAISED, which is the amount of user fees revenue collected at the clinic in a typical month, and the variable PATIENTS PAY FOR VISITS, which takes a value of one when patients pay for any kind of visitation to the clinic. FUNDING SUPPORT equals one when the clinic received funding from any source at all in 2012 other than through user fees. IN-KIND SUPPORT equals one when the clinic received any support in the form of supplies or materials from funding providers or health programs in 2012.

The supervision and community interaction variables include CLINIC SUPERVISOR, which equals one when the clinic has a supervisor (the person the OIC reports to or has responsibility over the clinic),

VILLAGE HEALTH COMMITTEE, which equals one when the clinic is supported by a Village Health Committee (VHC), and COMMUNITY ASSISTANCE, which equals one when community members volunteer to assist the clinic.

Table 8-4: Summary statistics of explanatory variables for health clinic regressions

Explanatory variables	N	Mean	SD
Type and location			
AID POST (0/1)	142	46.5	50.5
CHURCH (0/1)	142	37.4	48.6
PRIVATE (0/1)	142	5.9	23.9
CLINIC REMOTENESS INDEX (hours)	142	3.1	3.3
CLINIC SIZE (patient vists per day)	142	35.2	33.2
Management			
FEMALE OIC (0/1)	142	34.8	48.4
NUMBER OF YEARS OIC	142	8.9	8.8
BORN IN DISTRICT OIC (0/1)	142	49.5	50.2
USER FEES - FUND DRUGS (0/1)	142	28.7	45.7
OWN BUDGET - FUND DRUGS (0/1)	142	11.9	32.5
USER FEES - FUND FUEL (0/1)	142	26.7	44.6
OWN BUDGET - FUND FUEL (0/1)	142	11.7	32.3
USER FEES - FUND TRANSFER (0/1)	142	20.8	40.8
OWN BUDGET - FUND TRANSFER (0/1)	142	28.0	45.1
Resources			
USER FEES RAISED (K100 PER MONTH)	125	483.9	823.9
PATIENTS PAY FOR VISITS (0/1)	140	83.4	37.5
FUNDING SUPPORT (0/1)	130	25.0	43.5
IN-KIND SUPPORT (0/1)	142	34.2	47.6
ELECTRICITY (0/1)	142	40.5	49.4
Supervision and community			
CLINIC SUPERVISOR (0/1)	141	63.6	48.5
VILLAGE HEALTH COMMITTEE (0/1)	142	64.4	48.4
COMMUNITY ASSISTANCE (0/1)	139	58.1	49.5

Notes: Weighted data for 2012. Variables with (0/1) refer to binomial variables that take a value of zero or one (means are reported in per cent). USER FEES and OWN BUDGET are variables that equal one when drugs, fuel or patient transfer costs are funded via user fees and the clinic budget, respectively, and zero otherwise.

In addition to these explanatory variables, regressions also include three dummy variables on health clinic user characteristics when the dependent variable is based on the perceptions of clinic users. These dummy variables control for whether the user has official ties to the clinic, has official responsibilities at the clinic, or the user is a relative of a clinic worker. All regressions include dummy variables for each province (no constant term is estimated in the regressions).

8.5 Facility level findings in education

Regression findings for school infrastructure

The results for level regressions on school infrastructure-related dependent variables are presented in Tables 8-5 and 8-6. For example, upgrading school status from a community to a primary school is estimated to increase the share of permanent classrooms and teachers' houses by 17 and 24 percentage points respectively, as well as increase the share of good teachers' houses by 7 percentage points and the school infrastructure index by 11 percentage points.

Table 8-5: Regression results for school infrastructure regressions (in levels)

Variable (level measure)	PERMANENT CLASSROOMS (%)	GOOD CLASSROOMS (%)	PERMANENT TEACHER HOUSES (%)	GOOD TEACHER HOUSES (%)	CLASSROOMS THAT DON'T LEAK (%)
COMMUNITY SCHOOL (0/1)	-16.60		-24.09	-7.46	
	(6.02)***		(5.83)***	(4.48)*	
CHURCH (0/1)	-8.19		-12.22		
	(4.02)**		(4.20)***		
REMOTENESS INDEX (HOURS)	-1.28		-1.36		
	(0.40)***		(0.49)***		
BOM MEETINGS	1.50				
	(0.70)**				
BOM PARENT (%)		22.48			
		(12.81)**			
BOM MOST SAY - CLASSROOMS (0/1)		12.30			
		(5.35)**			
SO VISITS					2.67
					(1.38)*
SO NO REPORT (0/1)	-10.15			-8.77	
	(5.08)**			(4.48)*	
SO OBSERVED CLASSES (0/1)					8.23
					(4.57)*
REVENUE PER STUDENT (per K100)	3.51		2.43		
	(1.42)**		(1.40)*		
Province dummies	YES	YES	YES	YES	YES
R^2	0.89	0.53	0.82	0.43	0.85
N	231	229	255	212	203

Notes: Linear regression results based on pooled 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

The estimates on REMOTENESS INDEX highlight the impact of greater remoteness on the share of classrooms and teachers' houses made of permanent materials (an extra index hour is estimated to reduce the share by 1.3 and 1.4 percentage points respectively), and on the infrastructure index (a reduction of nearly one percentage point per hour). In separate regressions results (not presented here), the main driver of this effect is the number of hours it takes to travel from the school to the nearest bank.

An important finding is that additional revenue per student is important for building better constructed infrastructure and obtaining better provision of general infrastructure but not for ensuring that infrastructure is kept in good condition. The key factors that impact on the condition of infrastructure relate to characteristics of the BOM, and the extent of SO oversight. Another interesting finding is that the probability of church schools having enough toilets is 19 percentage points higher compared to government schools, but church schools have 8 and 12 percentage point lower share of permanent classrooms and teachers' houses, respectively, controlling for other school characteristics.

Table 8-6: Additional regression results for school infrastructure regressions

Variable (level measure)	DRINK WATER ALL YEAR (0/1)	ENOUGH TOILETS (0/1)	INFRASTRUCTURE INDEX (%)
COMMUNITY SCHOOL (0/1)	25.00		-10.60
	(8.18)***		(3.27)***
CHURCH (0/1)		19.12	
		(6.80)***	
REMOTENESS INDEX (HOURS)			-0.91
			(0.19)***
BORN IN PROVINCE HT (0/1)		-17.11	
		(7.12)**	
BOM MEETINGS		2.22	
		(1.26)*	
BOM MOST SAY - CLASSROOMS (0/1)		20.31	
		(6.67)***	
SO CHECKED RECORDS (0/1)	14.10	16.97	8.47
	(7.58)*	(7.59)**	(2.51)***
P&C MEETINGS		0.92	
		(0.40)**	
SCHOOL INVITES COMMUNITY (0/1)	15.59		
	(8.42)*		
REVENUE PER STUDENT (per K100)			1.38
			(0.83)*
2002/2001 Survey	-21.16		
	(8.48)***		
Province dummies	YES	YES	YES
R^2	0.77	0.65	0.93
N	208	208	222

Notes: Linear regression results based on pooled 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

The results for regressions in first-differences (i.e. panel regressions) indicate that a much smaller set of explanatory variables are significant determinants of infrastructure-related performance

outcomes relative to the regressions specified in levels. In part this result reflects the elimination of time-invariant variables from the set of explanatory variables due to first-differencing; explanatory variables that show little variation in magnitude over time are also not likely to have regression coefficients that are significantly different from zero. The ability to control for unobserved time-invariant variables greatly improves the reliability of the results, but reduces their explanatory power.

The results indicate that additional management effort by the BoM as well as BoMs that have the most say in decision making on building classrooms lead to significant improvements in school infrastructure. For example, an additional BoM meeting is estimated to increase the share of permanent classrooms and teachers' houses by 3.8 and 2.8 percentage points, respectively, as well as increase the probability of enough toilets by 3.8 percentage points. A move towards the BoM having the most say in decision making on building classrooms is estimated to increase the share of permanent classrooms 11 percentage points and increase the share of good teachers' houses by 15 percentage points. In addition, a 10 percentage point increase in the share of females on the BoM is estimated to increase the infrastructure index by 2 percentage points.

Table 8-7: Regression results for school infrastructure (in first-differences)

Variable (Change measure)	PERMANENT CLASSROOMS (%)	GOOD CLASSROOMS (%)	PERMANENT TEACHER HOUSES (%)	GOOD TEACHER HOUSES (%)	ENOUGH TOILETS (0/1)	INFRASTRUCTURE INDEX (%)
BORN IN PROVINCE HT (0/1)		17.53				
		(9.85)*				
BOM MEETINGS	3.83		2.77		3.75	
	(0.81)***		(1.20)**		(1.70)**	
BOM FEMALE (%)						20.86
						(8.51)**
BOM MOST SAY - CLASSROOMS (0/1)	11.29			15.43		
	(6.04)**			(6.30)**		
SO CHECKED RECORDS (0/1)						6.75
						(3.22)**
P&C MEETINGS			0.63			0.55
			(0.34)*			(0.22)**
HT MIXES WITH COMMUNITY (0/1)		21.59		14.17		
		(7.81)***		(5.96)***		
REMOTENESS INDEX (HOURS)						-0.85
						(0.36)**
CONSTANT	10.71		6.19			4.37
	(4.33)**		(2.82)***			(2.08)**
R^2	0.20	0.21	0.19	0.14	0.05	0.19
N	67	59	58	58	108	95

Notes: Linear regression results based on first-differenced 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

The infrastructure index is estimated to be 7 percentage points higher when the SO checks school records. Changes in community related

variables are also important with the share of good classrooms and teachers' houses estimated at 22 and 14 percentage points higher, respectively, when the Head Teacher mixes with the community. Also, an additional P&C meeting is estimated to increase the share of permanent teachers' houses and infrastructure index by 0.6 percentage points.

Regression findings for school resources

The regression results for school resources indicate the important role of school oversight by SOs and the community in driving better performance. The level regressions (see Table 8-8) indicate that when the SO checks school records the probability of Grade 5 teachers reporting sufficient textbooks and an ability to produce teaching aids in class increases by 13 and 17 percentage points, respectively. Schools that invite community members to help with programs are estimated to experience a near 17 percentage point increase in the probability of sufficient textbooks at schools. Schools with a head teacher born in the province are estimated to perform relatively worse in terms of sufficient textbooks and teachers being able to produce teaching aids.

The share of teachers working to teaching positions at schools is estimated to be 12 percentage points higher when the SO checked school records. While the estimates indicate that additional P&C meetings significantly reduce the ratio of teachers regularly working to teachers positions at the school, it is possible that this result is driven by reverse causality; a low ratio at schools may give rise to additional P&C meetings that attempt to address the problem of fewer teachers at the school than expected. Church schools are also estimated to have a lower share of teaching positions filled relative to government schools, controlling for a range of variables.

The regressions in first-differences did not produce statistically significant results.

Table 8-8: Results for school resources regressions (in levels)

Variable (level measure)	SUFFICIENT TEXTBOOKS (0/1)	PRODUCE TEACHING AIDS (0/1)	TEACHERS WORKING TO TEACHING POSITIONS (%)
CHURCH (0/1)			-8.62
			(4.82)*
BORN IN PROVINCE HT (0/1)	-16.47	-11.33	
	(7.46)**	(5.87)*	
SO CHECKED RECORDS (0/1)	13.21	17.18	12.12
	(5.95)**	(6.17)***	(5.50)**
P&C MEETINGS			-0.47
			(0.23)**
SCHOOL INVITES COMMUNITY (0/1)	16.55		
	(7.24)**		
2002/2001 Survey			
Province dummies	YES	YES	YES
R^2	0.35	0.84	0.90
N	197	202	221

Notes: Linear regression results based on pooled 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

Regression findings for school management

The level regression results on school management related variables (Table 8-9) indicate that church schools perform better at managing teachers, both in terms of getting teachers to schools on time and ensuring they spend their time teaching. Community interaction variables are also important in driving effective management of the school by the BoM and in teacher management.

Table 8-9: Results for school management regressions (in levels)

Variable (level measure)	BOM EFFECTIVE (0/1)	TEACHERS ON TIME (0/1)	TEACHERS SPEND TIME TEACHING (0/1)
CHURCH (0/1)		12.64	13.73
		(6.15)**	(5.82)**
REMOTENESS INDEX (HOURS)		0.99	
		(0.43)**	
SO CHECKED RECORDS (0/1)	13.77		
	(6.65)**		
HT MIXES WITH COMMUNITY (0/1)		20.48	13.61
		(6.17)***	(6.28)**
SCHOOL INVITES COMMUNITY (0/1)	28.03		
	(8.35)***		
2002/2001 survey	14.97		
	(7.93)*		
Province dummies	YES	YES	YES
R^2	0.79	0.70	0.74
N	199	230	230

Notes: Linear regression results based on pooled 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

The results for regressions specified in first-differences support the finding that community interaction variables are important for BoM effectiveness as well as teachers management. However, the results also indicate that the probability of BoM effectiveness declines the longer the Head Teacher has been at the school. An increase in real revenue per student is also important in raising the probability that teachers are on time at school.

Table 8-10: Results for school management regressions (in first-differences)

Variable (Change measure)	BOM EFFECTIVE (0/1)	TEACHERS ON TIME (0/1)	TEACHERS SPEND TIME TEACHING (0/1)
NUMBER OF YEARS HT	-1.76		
	(0.92)*		
HT MIXES WITH COMMUNITY (0/1)		36.61	16.74
		(12.86)***	(7.41)**
SCHOOL INVITES COMMUNITY (0/1)	38.44		
	(9.90)***		
REMOTENESS INDEX (HOURS)		1.11	
		(0.46)**	
Constant	-18.63		
	(6.54)***		
R^2	0.18	0.21	0.06
N	92	53	125

Notes: Linear regression results based on first-differenced 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

Regression findings for school outputs

The results for level regressions on school outputs are presented in Table 8-11. The level and first-difference regressions for school output variables were also specified with school performance measures as explanatory variables, such as PRODUCE TEACHING AIDS, TEACHERS SPEND TIME TEACHING and PERMANENT CLASSROOMS. This approach allows for the identification of direct determinants of school outputs, noting that these determinants will in turn be explained by other or common factors as shown in previous regression results in this chapter.

The estimates indicate that BoMs with a larger share of parents produce better outcomes in terms of getting enrolled students to be present at school (a 10 percentage point increase in BOM PARENT is associated with a near 2 percentage point increase in STUDENTS PRESENT). The share of students present is also estimated to decline with remoteness and when the Head Teacher is female but increase with revenue per student. The estimated impact of the Grade 5 teacher being able to produce teaching aids in the classroom is to raise STUDENT PRESENT by 10 percentage points.

The probability of most or all children in the community attending school is estimated to increase by 1.2 and 2.5 percentage points for every additional year the Head Teacher has been at the school and for every SO visit received by the school, respectively. Schools where the P&C reported that teachers spend time teaching are estimated to have a 12.5 percentage point high probability of most or all children attending school.

Table 8-11: Results for school output regressions (in levels)

Variable (level measure)	STUDENTS PRESENT (%)	CHILDREN ATTEND SCHOOL (0/1)
REMOTENESS INDEX (HOURS)	-1.00	
	(0.38)***	
BOM PARENT (%)	18.00	
	(8.69)**	
FEMALE HT (0/1)	-10.03	
	(5.31)*	
NUMBER OF YEARS HT		1.24
		(0.57)**
SO VISITS		3.07
		(1.31)**
Revenue per student (K100)	2.35	
	(1.41)*	
PRODUCE TEACHING AIDS (0/1)	10.44	
	(4.75)**	
TEACHERS SPEND TIME TEACHING (0/1)		12.51
		(5.87)**
2002/2001 survey	17.10	-14.23
	(4.98)***	(5.93)**
Province dummies	YES	YES
R^2	0.90	0.72
N	216	318

Notes: Linear regression results based on pooled 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

The first-difference regressions results (Table 8-12) also provide support for the positive relationship between the share of parents on the BoM and the share of students present at school: a 10 percentage point increase in BOM PARENT is associated with a 4 percentage point increase in STUDENTS PRESENT, controlling for other changes. However, a 10 percentage point increase in the share of parents on the BoM is estimated to reduce the probability of most or all children in the community attending school by 3 percentage points. The result indicates that the influence of parents on the BoM is to improve student attendance possibly at the expense of getting those children not in the school system to attend school.

The reduction in the lower primary school fee (LOWER SCHOOL FEE) has had a significant impact on increasing the probability that most or all children of school age attend school. Every K10 reduction in LOWER SCHOOL FEE is estimated to increase the probability of most or all children attending school by 2.8 percentage points, which is around an increase of 5.6 percentage points for the average school in the sample that reduced its lower primary school fee by K20.

A 10 percentage point increase in the share of permanent classrooms is estimated to increase STUDENTS PRESENT by 1.5 percentage points. Teachers that are able to produce teaching aids and who spend their time teaching are also estimated to positively impact on the probability that most or all children of school age attend school (16 and 23 percentage points, respectively).

Table 8-12: Results for school output regressions (in first-differences)

Variable (Change measure)	STUDENTS PRESENT (%)	CHILDREN ATTEND SCHOOL (0/1)
BOM PARENT (%)	39.25	-32.46
	(9.89)***	(18.35)*
LOWER SCHOOL FEE		-0.28
		(0.10)***
PERMANENT CLASSROOMS (%)	15.58	
	(6.88)**	
TEACHERS SPEND TIME TEACHING (0/1)		22.93
		(9.59)**
PRODUCE TEACHING AIDS (0/1)		15.91
		(7.35)**
CONSTANT	-18.11	15.31
	(3.14)***	(6.44)**
R^2	0.13	0.21
N	121	109

Notes: Linear regression results based on first-differenced 2001/2002 and 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

8.6 Facility-level findings in health

Regression findings for health clinic infrastructure outcomes

The regression results presented in Table 5-13 indicate that clinic type and location, OIC characteristics, the level of clinic resources, and supervision and community interaction variables are important determinants of the provision and condition of infrastructure at health clinics. Aid posts are more likely to have clinic rooms that leak and score much lower on the clinic infrastructure index. Similar to the finding for school infrastructure, remote clinics also perform worse in terms of clinic rooms that do not leak and the share of worker houses made of permanent materials (a reduction of 2.7 and 2.1 percentage points, respectively, for each additional CLINIC REMOTENESS INDEX hour). However, church and private clinics perform much better than government clinics in terms of the share of permanent worker houses.

There is a positive impact on the condition of clinic rooms when the OIC is from the local district but the infrastructure index is estimated to be lower by two-thirds of a percentage point for each additional year

the OIC respondent has been in the OIC position at the clinic. This negative impact on the infrastructure index is substantial given that the mean number of years the OIC has been in the position is about nine.

User fees are estimated to be an important determinant of infrastructure outcomes, as well as receiving in-kind support and greater interaction with the local community. An additional K100 raised per month is estimated to improve the share of good clinic rooms and good worker houses, as well as the infrastructure index, by over one percentage point for each. Clinics that receive support from a Village Health Committee (VHC) have clinic rooms that are 12 percentage points less likely to leak. Clinics that receive community assistance are estimated to achieve higher shares of good clinic rooms, permanent worker houses, good worker houses, and clinic rooms that don't leak by around 14 to 21 percentage points.

Table 8-13: Results for health clinic infrastructure regressions

	GOOD CLINIC ROOMS (%)	PERMANENT WORKER HOUSES (%)	GOOD WORKER HOUSES (%)	CLINIC ROOMS THAT DON'T LEAK (%)	ENOUGH TOILETS (0/1)	CLINIC INFRASTRUCTURE INDEX (%)
AID POST (0/1)				-18.65		-24.00
				(6.74)***		(4.81)***
CHURCH (0/1)		15.08				
		(6.17)**				
PRIVATE (0/1)		39.98				
		(18.57)**				
CLINIC REMOTENESS INDEX (hours)		-2.73		-2.10		
		(1.51)*		(0.77)***		
NUMBER OF YEARS OIC						-0.67
						(0.27)**
BORN IN DISTRICT OIC (0/1)				18.23		
				(5.92)***		
USER FEES RAISED (K100 PER MONTH)	1.05		1.64			1.06
	(0.38)***		(0.34)***			(0.27)***
IN-KIND SUPPORT (0/1)		12.42				
		(6.85)*				
CLINIC SUPERVISOR (0/1)					18.69	
					(10.20)*	
VILLAGE HEALTH COMMITTEE (0/1)				11.56		
				(6.30)*		
COMMUNITY ASSISTANCE (0/1)	15.69	13.83	21.03	18.70		
	(7.88)**	(8.14)*	(8.18)**	(5.98)***		
Province dummies	YES	YES	YES	YES	YES	YES
R^2	0.56	0.86	0.43	0.89	0.51	0.69
N	119	92	91	114	111	116

Notes: Linear regression results based on 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively. GOOD CLINIC ROOMS and GOOD WORKER HOUSES are buildings that do not need rebuilding or maintenance.

Regression findings for health clinic resources outcomes

The results presented in Table 8-14 indicate that clinic type and location, management characteristics, user fee revenue and support from funding providers, and community support are important determinants of the condition and provision of resources at facilities. Aid posts are less likely to have refrigeration or drugs available, and

more remote clinics are less likely to have water access but have a higher share of clinic positions filled by workers.

Compared to government run clinics, church run clinics are estimated to have a 17 percentage point higher probability of water access and private run clinics have an 80 percentage point higher probability of refrigeration, controlling for other characteristics. Private clinics are also estimated to have a 21 percentage point higher score on the drug availability index.

OICs who have access to larger user fee revenue and those who choose to fund fuel expenses from this revenue source are more likely to have fuel available at the clinic, but OICs who have been in the position for a long time are less likely to have fuel available.

Table 8-14: Results for health clinic resources regressions

	WATER ACCESS (0/1)	REFRIGERATION (0/1)	DRUG AVAILABILITY INDEX	FUEL AVAILABLE (0/1)	ZERO DOCTOR VISITS (0/1)	WORKERS TO CLINIC POSITIONS
AID POST (0/1)		-55.28	-24.49			9.13
		(7.96)***	(2.97)***			(5.35)*
CHURCH (0/1)	17.08					
	(8.51)**					
PRIVATE (0/1)		80.1	21.02			
		(24.81)***	(7.05)***			
CLINIC REMOTENESS INDEX (hours)	-3.35					2.52
	(1.87)*					(0.64)***
CLINIC SIZE (tens of patient vists per day)			0.70			2.09
			(0.39)*			(0.77)***
NUMBER OF YEARS OIC				-1.03		0.73
				(0.41)**		(0.39)*
PATIENTS PAY FOR VISITS (0/1)			8.55			
			(3.70)**			
USER FEES - FUND FUEL (0/1)				25.2		
				(9.66)**		
USER FEES RAISED (K100 PER MONTH)		0.98	0.24	0.67		
		(0.37)***	(0.11)**	(0.39)*		
FUNDING SUPPORT (0/1)			7.20			
			(3.45)**			
IN-KIND SUPPORT (0/1)	17.59	11.85		14.94		
	(8.00)**	(6.35)*		(7.72)*		
CLINIC SUPERVISOR (0/1)			7.13		-22.49	
			(3.43)**		(5.51)***	
VILLAGE HEALTH COMMITTEE (0/1)			5.1			
			(2.77)*			
COMMUNITY ASSISTANCE (0/1)	14.64					
	(8.67)*					
Province dummies	YES	YES	YES	YES	YES	YES
R^2	0.76	0.78	0.96	0.76	0.90	0.94
N	115	114	114	117	124	94

Notes: Linear regression results based on 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively.

Clinics that charge patients for treatment, receive more in user fees, and receive funding support are more likely to have drugs and medical supplies available. This finding may reflect better management practices at facilities with better drug availability or, perhaps to some degree, a lower rate of drug consumption in facilities that charge for their use. Clinics that are able to identify a supervisor score seven percentage points higher on the drug availability index. Clinics that are

able to source in-kind support and funding from health funding providers and health programs are more likely to have access to water, refrigeration and fuel at the clinic.

Aid posts score 24 percentage points lower on drug availability but facilities supported by a VHC score about 5 percentage points higher. Church-run facilities and those that receive community assistance are estimated to have about a 20 and 17 percentage point higher probability of having access to water, respectively.

Doctor visits are positively related to when clinics are able to identify a supervisor; having a supervisor reduces the probability of zero doctor visits to the clinic by 22 percentage points.

Regression findings for health clinic management outcomes

The results of regressions on management performance measures are presented in Table 8-15. Compared to government run clinics, church run clinics are estimated to have a 16 percentage point higher probability of workers at the clinic often or all of the time, 14 percentage point lower probability of funding problems at the clinic, and a 14 percentage point higher probability of patients being attended to on arrival. Private run clinics also perform well on these measures.

Not surprisingly, higher user fee revenue at clinics is associated with a lower probability of funding problems. This is also the case for clinics that receive in-kind support. However, clinics that receive in-kind support were less likely to have workers at the clinic often or all of the time. Clinics that received funding support were also more likely to attend to patients when they arrived.

Clinics that did not receive a doctor visit were estimated to have a 26 percentage point lower probability of workers being at the clinic often or all of the time. Interestingly there results show a negative relationship between COMMUNITY ASSISTANCE and WORKERS AT CLINIC, indicating that community sourced workers at clinics and official clinic workers are substitutes to some degree.

Table 8-15: Results for health clinic management regressions

	WORKERS AT CLINIC (0/1)	FUNDING PROBLEMS (0/1)	STAFFING PROBLEMS (0/1)	PATIENTS SEEN ON ARRIVAL (0/1)
AID POST (0/1)				13.12
				(7.88)*
CHURCH (0/1)	17.61	-14.05		13.91
	(8.08)**	(8.40)*		(5.27)***
PRIVATE (0/1)	78.62	-45.00	-49.44	
	(15.05)***	(15.38)*	(18.46)***	
CLINIC SIZE (patient vists per typical day)	3.34			
	(1.30)**			
BORN IN DISTRICT OIC (0/1)	-13.24			
	(7.32)*			
USER FEES RAISED (K100 PER MONTH)		-0.83		
		(0.49)**		
FUNDING SUPPORT (0/1)	14.93			12.20
	(8.96)*			(7.23)*
IN-KIND SUPPORT (0/1)		-21.41		
		(8.47)**		
COMMUNITY ASSISTANCE (0/1)	-22.48			
	(8.20)***			
Patient respondent dummies	YES	YES	YES	YES
Province dummies	YES	YES	YES	YES
R^2	0.82	0.56	0.51	0.91
N	109	111	112	110

Notes: Linear regression results based on 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively. Patient respondent dummies (patient has officials ties to the clinic, patient has official responsibilities at the clinic, patient has relatives who work at the clinic) capture personal data on the patient who provided the dependent variable data.

Regression findings for health clinic outputs

Apart from directly treating patients, the main activities of health facilities relate to conducting health patrols and health promotion in the local community, as well as transferring patients to higher level facilities when needed. Aid posts are less likely to be able to perform these activities and church-run clinics are much better performers than government-run clinics (see Table 8-16). Church run clinics are estimated to conduct 14 more health patrols than government facilities, or have about a 13 percentage point higher probability of conducting more than 10 health patrols in a year. Church-run clinics also have about a 15 percentage point higher probability of being able to transfer patients relative to government facilities. Privately-run clinics perform much better than government clinics in delivering health promotion activities. Compared to government run clinics, church run clinics are estimated to have a 17 percentage point lower probability of having service quality problems, and private clinics are estimated to have a 55 percentage point higher probability of meeting the community's health needs.

OICs that have been in the position for long periods are less likely to conduct health promotion in the community or transfer patients and are more likely to be at clinics which have service quality problems.

OICs that that raise user fees specifically to fund patient transfers have a much higher probability (around 14 percentage points) of being able to carry out this activity. User fees are also estimated to be an important input to carrying out more than 10 health patrols in a year. Clinics that are able to source funding support are estimated to have a 15 percentage point lower probability of service quality problems, and a 19 percentage point probability of being able to meet the community's health needs.

Table 8-16: Results for health clinic output regressions

	HEALTH PATROLS	PATROLS GREATER THAN 10	HEALTH PROMOTION (0/1)	TRANSFER PATIENTS (0/1)	SERVICE QUALITY PROBLEMS (0/1)	MEETS COMMUNITY NEEDS (0/1)
AID POST (0/1)	-9.52			-24.75	-27.5	
	(5.87)**			(6.95)***	(10.15)***	
CHURCH (0/1)	13.57	12.62		15.30	-16.19	
	(6.75)**	(5.69)**		(6.78)**	(7.98)**	
PRIVATE (0/1)			43.88			53.95
			(10.09)***			(18.16)***
CLINIC REMOTENESS INDEX (hours)			-2.61			
			(1.26)**			
CLINIC SIZE (tens of patient vists per day)					-2.92	
					(1.57)*	
BORN IN DISTRICT OIC (0/1)		-11.55			15.46	
		(6.22)*			(8.27)*	
NUMBER OF YEARS OIC			-1.29	-1.12	1.35	
			(0.48)***	(0.41)***	(0.51)***	
USER FEES - FUND TRANSFER (0/1)				14.38		
				(7.07)**		
USER FEES RAISED (K100 PER MONTH)		0.79				
		(0.38)**				
FUNDING SUPPORT (0/1)						19.79
						(7.00)***
IN-KIND SUPPORT (0/1)			14.19			
			(6.59)**			
COMMUNITY ASSISTANCE (0/1)			18.44			
			(6.84)***			
Patient respondent dummies	NO	NO	NO	NO	YES	YES
Province dummies	YES	YES	YES	YES	YES	YES
R^2	0.45	0.47	0.86	0.86	0.44	0.89
N	111	119	109	124	113	108

Notes: Linear regression results based on 2012 data. Only variables with coefficients significantly different from zero at the 10% level are presented. Heteroskedastic consistent standard errors in parentheses; ***, **, and * indicates variable is significantly different from zero at the 1%, 5% and 10 % level, respectively. Patient respondent dummies (patient has officials ties to the clinic, patient has official responsibilities at the clinic, patient has relatives who work at the clinic) capture personal data on the patient who provided the dependent variable data.

8.7 Overall findings

The regression analysis highlights many determinants of good performance across infrastructure, resources and equipment, management, and facility output related variables. From this perspective, the results indicate that initiatives aimed at strengthening facilities should not have a narrow focus, such as on providing higher levels of funding alone; institutional strengthening should instead take a multi-dimensional approach.

Overall, management characteristics of schools and health facilities appear to have the greatest impact on performance outcomes. For schools, the make-up of the BoM (the share of parents and females), whether the BoM meets regularly, and whether the BoM has the most say on making decisions related to the school are all important.

For health clinics, good performance requires management to raise user fee revenue, budget and apply for support from health funding providers, and direct funds and other resources to performing key activities at the clinic. As noted in Chapter 6, the recently introduced free health policy, which reduces the ability of health facilities to raise user fees, may undermine the ability of health facilities in this regard.

While facility management characteristics are important, it is also important to consider the role that the local community plays in driving better facility management. Community interaction variables provide a positive impact on facility performance on their own, but there is evidence from the regression results that they also positively impact on facility management.

The question for policy makers is how they can vary policy settings to achieve better performance outcomes at schools and health facilities. For schools, facility management can be improved by strengthening the oversight role of the BoM, the P&C and Standards Officers. Despite substantial increases in primary education funding in PNG over the last decade, the quantity of inspections by SOs has not improved. But the quality of SO inspections has improved and has had a positive impact on school performance.

For health clinics, improvements can be made by replicating the strengths of the primary education system within the primary health sector. Health clinics do not have an equivalent of a school BoM and so the OIC, who tends to come from a medical rather than a management background, is often responsible for facility management. The VHC may be seen as an equivalent of the P&C at schools, but there are fewer of them, especially in relation to health centres rather than aid posts. Further research is needed to understand how and why VHCs are established in some, but not other, health facility catchment areas, and the activities that VHCs undertake. While schools are able to identify supervisors that oversee their operations, this is not the case for many health clinics. Overall, the formal and informal mechanisms for ensuring that health clinics are performing adequately are weak relative to those in the education system. There is also evidence that health clinic performance across a number of measures declines as the number of years the OIC has been in the position increases. Rejuvenation of health clinic management may then be an important way of improving the primary health care sector.

Finally, the regression analysis provides evidence that, controlling for other variables, church-run schools and health clinics perform better than government-run facilities across a range of measures. In particular, according to P&C representatives, teachers are more likely

to spend most of their time teaching at church schools than at government ones, and whether teachers spend time teaching turns out to be the critical determinant of whether children attend school. Teachers are 14 percentage points more likely to be often or always teaching in church schools and 13 percentage points more likely to be on time at school. Church clinics also perform better than government clinics across a range of dimensions. Church clinics are 17 per cent more likely to have water access, 13 per cent more likely to have more than 10 health patrols a year, 15 percentage points more likely to be able to transfer patients, and 16 percentage points less likely to have service quality problems. Health workers at church clinics are also 18 percentage points more likely to be at the clinic often or all of the time and 14 percentage points more likely to attend to patients on arrival. Church clinics are 14 percentage points less likely to have funding problems compared to government clinics.

It would appear that church facilities are better able to discipline, motivate and/or incentivise their workers. In the case of health clinics, it seems that they are better equipped, and more likely to carry out basic services.

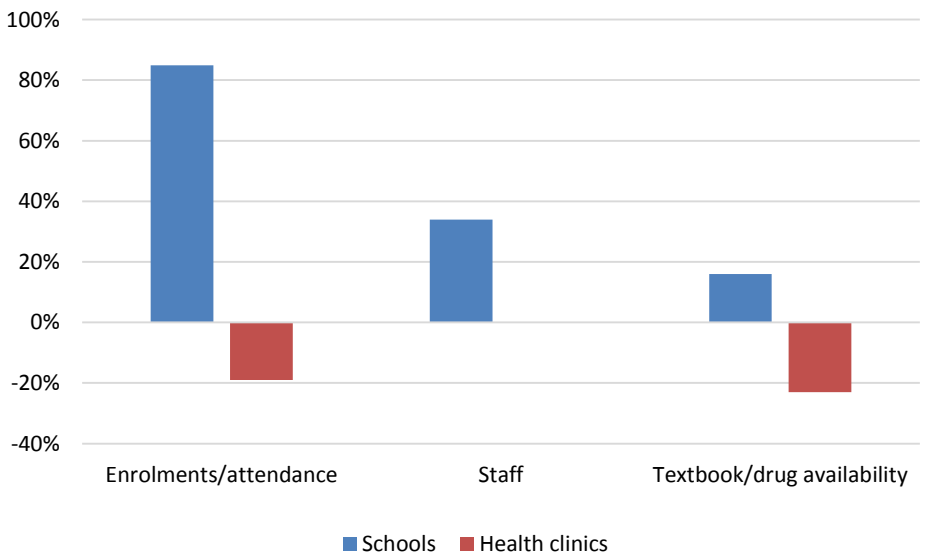
9 CONCLUSION

9.1 Introduction

The preceding chapters clearly show large differences in performance between PNG's primary schools and health clinics over the last decade. It was certainly not a lost decade for PNG's schools. Rather, education was in expansion mode. The expansion of facilities was not able to keep up with the increase in enrolments, but on average primary schools had substantially more teachers, classrooms and textbooks in 2012 than in 2002.

Primary health care, by contrast, was in retreat over the decade. The number of patients using health clinics may actually have fallen. Fewer drugs were available at surveyed clinics. There was no increase in the number of health workers. The contrasting fates of the two sectors are captured by the graph below.

Figure 9-1: Percentage changes in key indicators: the contrasting fates of PNG's schools and health clinics, 2001/2 to 2012



Notes: Growth in enrolments measured since 2001 due to large increase in enrolments in that year. Health clinic attendance is on a typical day. Staff growth based on numbers reported to be regularly working, and is zero for health clinics. Textbooks and drug availability figures are based on averages across the textbooks and drugs and supplies surveyed.

Many of the improvements in education indicators are statistically significant. Negative changes in the health indicators are not statistically significant, but the absence of growth in health service delivery indicators is itself a source of concern in the presence of rapid population growth. The fact that the indicators tend to go one way for health and another for education also suggests that the results obtained are not the results of sampling variability.

Of course, not all developments in education were positive. Absenteeism rates increased, and this partially offset the enrolment gains. And there was no improvement in the proportion of classrooms

and teachers' houses in a good condition. Generally, however, this analysis naturally leads to the question: why has education done so much better than health? Why has one sector experienced a decade of expansion, the other a decade of stagnation or contraction?

And why, for that matter, do some provinces do so much better than others in both education and health? Why is East New Britain a stand-out? And then, going beyond the sectoral and provincial level, why do some individual facilities do much better than others? Is it all all down to finance, or does governance also matter?

This chapter concludes the report by providing some answers to these questions based on the results presented in Chapters 3 to 7 and the facility-level regression analysis presented in Chapter 8. The next four sections seek explanations based on our analysis in relation to four dimensions: financing, governance, agency and the workforce. The final two sections conclude with a summary of key findings and recommendations.

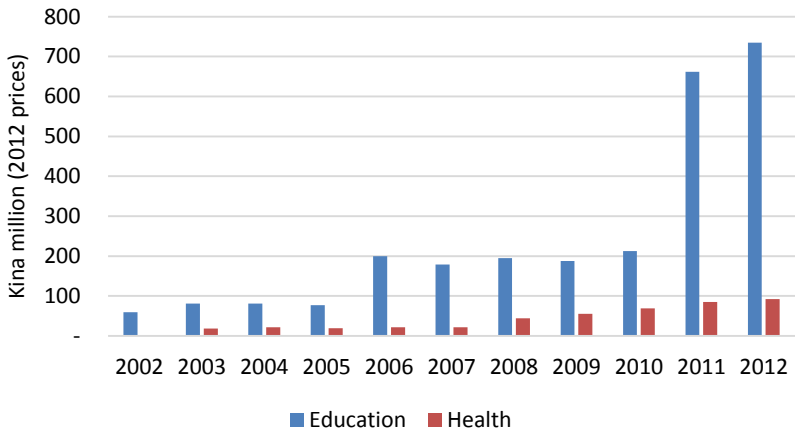
9.2 Finances

Whatever explains the differences between health and education performance, it is clear that it is not the reduction in user fees. Both primary schools and health clinics reduced their charges over the last decade, before abolishing them in 2012 and 2013 respectively. In education, enrolments have increased greatly, but in health, patient numbers have fallen. Why hasn't reducing fees had the same effect in health that it seems to have had in education?

The first answer is simply that the national government has been pumping a lot more money into education than health. Figure 9-2 compares, on the one hand, central government funding for the education function grant and school subsidy payments with, on the other, funding of the health function grant and of operational costs for church health services. That is, it shows the resources available for non-salary recurrent costs for PNG's schools and health clinics. There is no comparison, either of amounts, or of rate of increase. Even before the abolition of tuition fees in 2012, external funding to health clinics had been left way behind by external funding to schools.

Another difference between health clinics and schools when it comes to finances is the way they receive support. Only 44 per cent of clinics have a bank account, whereas nearly all schools do. Nearly all the support that schools receive is through external funding, whereas clinics are much more reliant on in-kind support and user fees: less than 20 per cent received external funding.

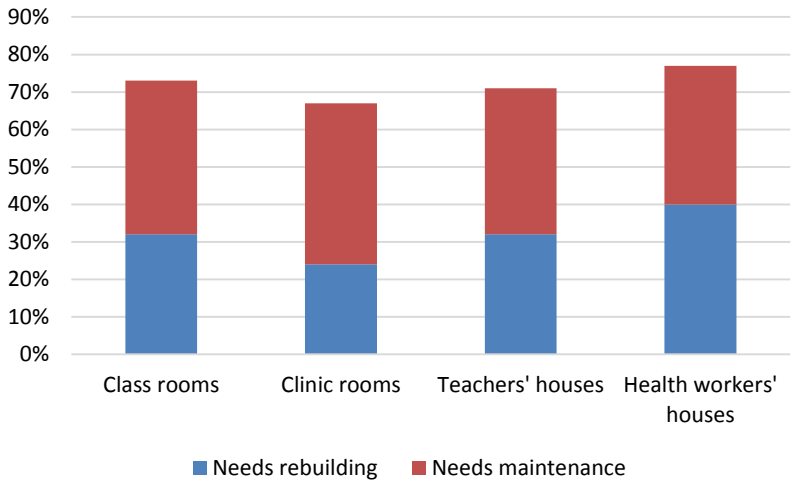
Figure 9-2: Central government funding for health facilities and school operational costs (Kina million, 2012 prices)



Notes: The health funding combines the provincial health function grant with operational costs for the Christian Health Services. We only have data for the latter from 2011, and we assume that before that it grows in line with the health function grant. The education funding combines school subsidy payments with the provincial education function grant. Consumer Price Index used to deflate the series. Sources: National budget documents and Piel (2013).

Finally, one financial issue faced by both schools and health clinics is the neglect of spending on maintenance. This leads to buildings becoming unusable. As Figure 9-3 shows, 65 to 80 per cent of classrooms, clinic rooms and staff houses require rebuilding or maintenance. There is no sign of any improvement in this indicator in the education sector over the last decade, and, given the precarious financial position of the health sector, it is unlikely that the state of PNG's health clinics is improving either.

Figure 9-3: Rebuilding and maintenance requirements in schools and clinics, 2012

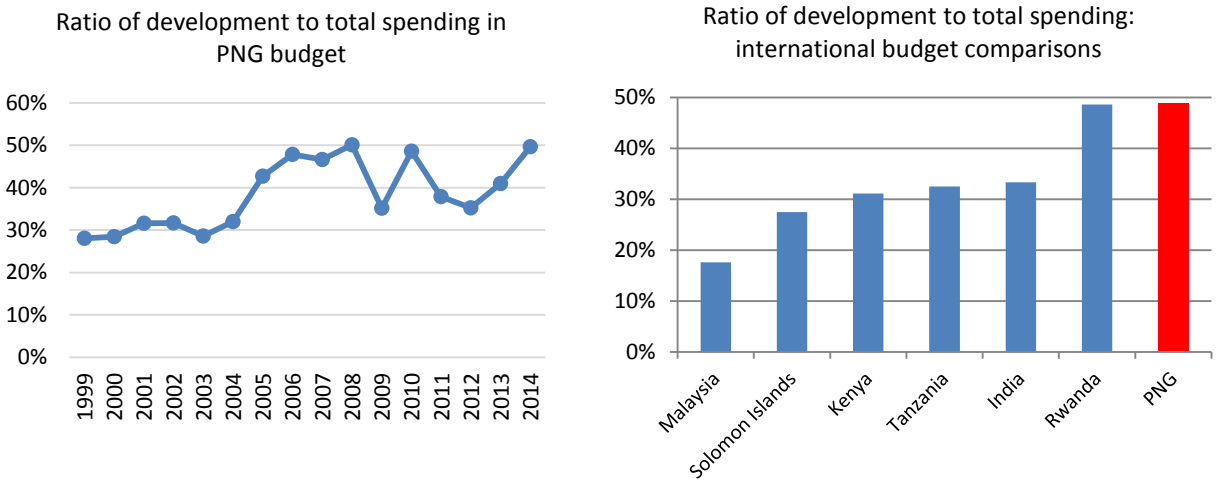


Schools are now spending more on maintenance, because they have more funds overall, but the priority for spending from new resources

is for infrastructure (Figure 3-13). Only a third of health clinics said that they had undertaken maintenance in 2012 (Table 4-7).

A bias against maintenance and in favour of construction can be seen in PNG's budget as a whole, where the share of the development budget in total government spending has risen over the last decade and has now reached 50 per cent, one of the highest in the world (Figure 9-4). The development budget does itself contain considerable recurrent funding, but it is all in the form of project funding. Because of this (and because projects change from year to year), the development budget does not provide a suitable mechanism for the financing of ongoing expenditure requirements such as maintenance. School subsidy payments are a good source for funding maintenance because they will be available year after year. Whether they will be used for maintenance, however, remains to be seen. The subsidy policy allows maintenance as an area of expenditure to be financed by school subsidy payments, but does not mandate it. Perhaps it should.

Figure 9-4: Development spending as a share of total government expenditure - PNG trends and international comparisons



Source: PNG budgets and budget documents of the other countries shown (most recent years available). For PNG, 2013 are actuals and 2014 budget estimates. Some earlier years include trust fund and supplementary spending in the development budget.

9.3 Governance

The differences in finance between the two sectors are striking, but far from the whole story. The governance arrangements around the two sets of facilities are very different as well. In summary, primary schools are more closely supervised and better connected to their communities.

On the supervision front, nearly all the schools, almost 80 per cent, received a visit from a supervisor in 2012 (Figure 3-10). This was true of only 40 per cent of health clinics (Table 4-13). Schools also have a lot of room for improvement, however. Only 39 per cent of schools received an inspection in relation to the subsidy payments they received in either 2011 and 2012 (Table 5-6). And 20 per cent of

schools did not receive a visit from a Standards Officer in either of these two years (Table 3-16). There would seem to be a clear need to increase supervisory resources. For example, the education budget for inspections and standards was K7.1 million in 2013 (in 2011 prices), less than its level of K8.8 million in 2003.

Nearly all schools have a Board of Management (BoM). As we saw in Chapters 3 and 5, BoMs do not just exist on paper. They are active, and they have real power. 95 per cent of BoM chairs say that they manage school assets (Figure 3-12) and they are viewed by two-thirds of Head Teachers as the decision maker in relation to school subsidy payments (Table 5-7).

There is no counterpart to the BoM in the health sector. Only 60 per cent of health clinics, mainly aid posts, have a Village Health Committee (VHC). The VHC is similar in function to the Parents and Citizens (P&C) Committee at a school. Neither has real power. Instead, they are vehicles for community engagement. But school P&C Committees are more widespread and active than VHCs. 96 per cent of schools had a P&C Committee in 2012, but only 64 per cent of health clinics had VHCs. And P&C Committees met on average 3.9 times a year in 2012, compared to 2.2 times for VHCs.[21]

In other words, it would seem that schools have a well-established, mature and functioning governance system. Health clinics do not.

Our regression analysis underlines the importance of governance for performance. The number of times the BoM met and its extent of influence emerge as key determinants of the extent to which schools have improved in terms of the quality of their classrooms, teachers' houses and infrastructure generally. For some performance outcomes, whether the Head Teacher mixes with the community, and the number of P&C meetings are also important. Whether or not a Standards Officer is active in inspecting a school also appears to be significant for school performance. Interestingly, whether or not the BoM is perceived by the community to manage the school effectively is influenced by the extent of formal oversight by Standards Officers and interaction between the school and the community.

9.4 Agency

Closely related to considerations of governance are those of agency: does it matter whether the school or clinic is managed by the government or by a church agency? Between one-third and 40 per cent of the sample of schools and clinics were in the latter category. In many regards, government and church-run facilities appear indistinguishable when summary statistics are compared, but not in all. Some of the most interesting differences between the two types are summarised below in Table 9-1.

21. See Table 3-17 and Table 4-14 for the numbers in this paragraph.

The gap between church and government schools seems to have opened up over the last decade. Church schools have had more success in increasing enrolments, and in getting their teachers to turn up and teach. In 2012, about three-quarters of community representatives said that their church school teachers normally turned up on time and most spent their time teaching, but only 50-57 per cent of community representatives said this about their government school teachers.

Likewise in health clinics, 83 per cent of health workers in church-run clinics were said to be always or often available, compared to 60 per cent for workers in government clinics. Church-run health clinics are no more likely to get external funding than government ones, but if they do, they get a lot more.

The importance of the differences between agency type is also suggested by the regression analysis. This shows that teachers are 14 percentage points more likely to be often or always teaching in church schools, and that schools, where it is the case that teachers are often or always teaching, are 13-23 percentage points more likely to be the ones that most or all students in the area attend. Church health clinics also perform better than government clinics and deliver more outputs. The regression analysis reveals that, controlling for other variables, church clinics are 17 per cent more likely to have water access, 13 per cent more likely to have more than 10 health patrols a year, 15 percentage points more likely to be able to transfer patients, and 16 percentage points less likely to have service quality problems. Health workers at church clinics are also 18 percentage points more likely to be at the clinic often or all of the time and 14 percentage points more likely to attend to patients on arrival. Church clinics are 14 percentage points less likely to have funding problems compared to government clinics.

More research is definitely required, but it would appear that church-run facilities, both schools and health clinics, are better able to discipline, motivate and/or incentivise their workers. Church-run health clinics also appear to be better funded, and therefore better equipped, and more likely to carry out basic services. These results make a strong case for shifting to greater reliance on church schools and health clinics.

Table 9-1: Some comparisons between church and government schools and health clinics

		Government		Church	
		2002	2012	2002	2012
Schools					
Most or all children in the community attend school	%	65	66	59	76
Increase in enrolments (2002 to 2012)	%		50		64
Teachers always or often in class on time each day	%	76	50	60	74
Teachers always or often spend time teaching	%	66	57	72	77
Health clinics					
Health workers always or often available	%		60		83
Users rate health services as poor	%		20		6
Funding received from budget submission (% of all clinics)	%		11		12
Funding received from budget submission (if submitted)	K		9,567		77,254
In-kind support in the form of supplies or materials (% of all clinics)	%		36		36
In-kind support in the form of supplies or materials (if received)	K		20,200		78,600

Notes: Answers from community representatives, except for enrolments and for the funding questions. Ratings of health worker availability and quality of service provision are simple averages over health centres and aid posts.

9.5 Workforce issues

How workforce challenges are responded to is in part a function of sector financing and governance and agency arrangements, which have already been addressed. However, there are a few important workforce-specific issues facing primary schools and health clinics. These are addressed below.

One response to the stagnation in the number of health worker staff regularly working between 2002 and 2012 (Table 4-1) might be to call for a hiring expansion. But recall also the decline in the number of patients using the clinics. In fact, over this period, the patient/staff ratio *fell* from 11.8 to 8.7 (comparing patients on the day before the survey to staff present at the day of the survey). A 2010 study of PNG's health centres found that "there is in most areas capacity for increased service delivery using present staffing levels" (Inder et al. 2011, p. 4).

Hiring more staff should not therefore necessarily be the first priority for PNG's health clinics across the board. A more targeted approach is needed, finding more staff for clinics that are delivering services and facing strong demand, and replacement staff for those who have retired. The Head Teachers we talked to had been in their position for three years. The average Officer in Charge has been there for nine. There is no-one to replace him or her, just as there is no one to replace retired health workers, many of whom remain in their position.

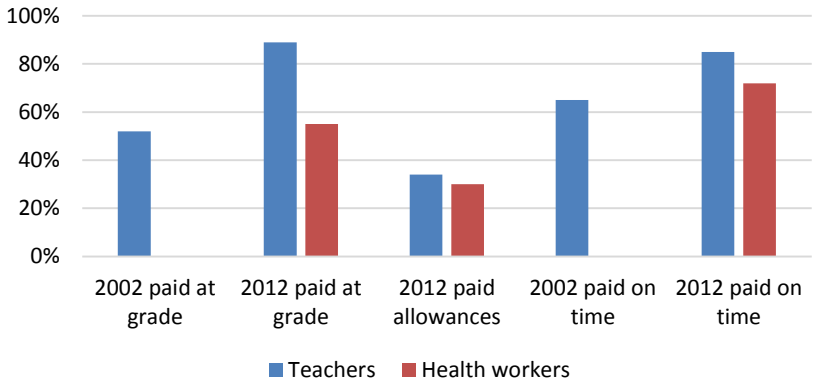
Replenishing the health sector workforce will not be easy. The World Bank (2013) documents that training institutions are not able to produce enough staff even to meet attrition rates.

There are also indicators that suggest problems with staff morale at health clinics. In fact, there are a number of important contrasts

between teachers and health workers when it comes to pay (Table 9-5). Almost half the Grade 5 teachers interviewed in 2002 said they were not paid at grade, a similar fraction to health workers today, but, by 2012, only 11 per cent of teachers made this complaint. Only a minority of both teachers and health workers say that they are paid the allowances they are entitled to. But 85 per cent of teachers say that they receive their pay on time, up from 65 per cent in 2002, and compared to 72 per cent of health workers.

The health sector has to find a way to address these problems. Clearly, it will require greater recurrent funding, but the education sector shows that it can be done.

Figure 9-5: Pay issues for teachers and health workers



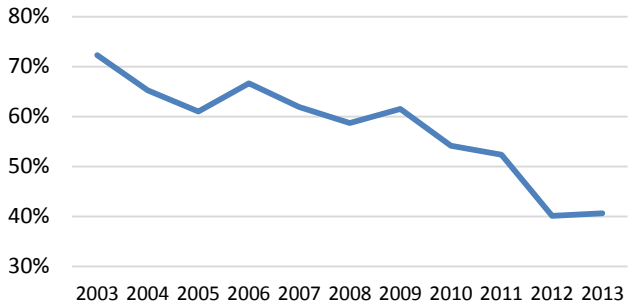
The challenges faced by the education sector are quite different to those faced by health. Over the last 10 years, the number of working teachers has gone up by 30 per cent. The teacher salary budget (including secondary school teachers) has gone up by about 25 per cent (after inflation). This is consistent with the sharp reduction in the extent of ghost teachers which we observe (Table 3-10) as the growth in working teachers exceeds that of the salary bill.

But now PNG needs to hire more teachers. Average class sizes have risen, as has the proportion of classes above the offical maximum size of 45. And in some provinces and grades, class sizes are as high as 80 (Figure 5-5). Unfortunately, funds for more hiring have not been allocated in the 2014 budget. It shows the nominal salary bill staying flat in the coming years, despite a 3-year pay deal struck with teachers in 2013, which will see salaries increase by 10 per cent every year. Paying existing teachers will not be possible within this tight budget, and there will certainly be no space for hiring new teachers.

Normally, developing countries face the problem that the cost of hiring sufficient teachers crowds out non-teaching inputs. Nordstrum (2013) finds that salary costs “constitute the lion’s share of education budget spending in the vast majority of countries.” In PNG, the ratio of teacher salaries to education spending has fallen dramatically over time. As

Figure 9-6 shows, it has fallen from over 70 per cent in 2003 to 40 per cent currently. This adds to the case for spending more on teachers.

Figure 9-6: Share of teachers' salaries in government school spending in PNG



Note: Some minor items estimated before 2006. Source: PNG national budget documents.

Finally, one positive development in both primary schools and health clinics is the rise of female participation in the two respective workforces. There are now more female than male teachers and health workers, and a growing number of women in facility management positions. The box on the next page provides details.

In summary, all four issues of funding, governance, agency, and the workforce emerge from the analysis as important in explaining why schools have done better than health clinics, and why some individual facilities do better than others.

9.6 Ten key findings

The analysis presented above does not cover all aspects of education and health sector performance. Our survey results do not provide direct measures of learning or the quality of health care received. Nevertheless, the information collected and analysis undertaken is directly relevant to questions about service delivery quantity and quality. In this concluding section, we distill our research results into ten key findings.

First, development progress in PNG is neither inevitable nor impossible. The last decade was by no means completely lost. Important progress was made by PNG's schools, but not by its health clinics. Recognising this, and understanding why, is critical.

Second, financing matters. PNG's schools have been assisted by their much greater access to government resources over the last decade. By contrast, health clinics have been starved of resources.

Third, supporting schools and health clinics is about more than increasing budgets. Ways have to be found to deliver this support at the facility level. Schools have worked out a way to do this (through bank accounts, under BoM supervision); health clinics have not. One of the key findings of the report is that 41 per cent of health clinics did not receive external support in 2012.

Good news on the gender staffing front

The last decade has seen a transformation in the gender composition of PNG's educational workforce. In 2002, only 13 per cent of primary school Head Teachers were female. In 2012, it was 27 per cent, more than double. The number of female teachers also increased sharply: from 27 to 55 per cent. (Note that we only surveyed the gender of the Grade 5 teachers we interviewed (one per school), but we can use this to generalise about primary school teachers.) In other words, whereas a decade ago only one-quarter of PNG's primary school teachers were female, now more than half are.

The increase in the representation of women in the ranks of managers of PNG's health clinics is much less dramatic. The share of female clinic Officers in Charge rose between 2002 and 2012, but only from 36 to 41 per cent. This is consistent with the fact that we find no growth in the total number of workers at these health clinics over the last decade. We also find that health workers and managers have normally been in position for a very long time: 9 to 10 years. With no growth in aggregate numbers and little turnover, it is not surprising that there has been little expansion in the number of female OICs. A promising indicator, however, is that just over half of health workers (other than OICs) were female in 2012. (These results are not available for 2002, and are based in 2012 on the gender of the non-OIC health worker we interviewed.) PNG's future OICs and Head Teachers are today's health workers and teachers, and they are mainly female.

Government facilities led church ones on female representation for most of the four occupational categories.

There are some clear provincial variations. In 2012, about two-thirds of Head Teachers and Grade 5 teachers in the National Capital District (Port Moresby) were female. 70 per cent or more of teachers were female in West New Britain and Morobe as well. At the other end, in Enga, only 3 per cent of Head Teachers were female and only 30 per cent of teachers.

Of course, primary school teachers and health workers (or nurses) are predominantly female in many countries. From that perspective, these results are not surprising. What is interesting though is how quickly PNG is catching up. The increasing number of professional women in the country will no doubt drive social change, and contribute to greater gender equality more broadly.

Percentage of females in school and health facility leadership and working roles

	Head Teachers		Grade 5 teachers		Officers in Charge		Health workers
	2002	2012	2002	2012	2002	2012	2012
Overall	13	27	27	55	36	41	52
Government	15	31	27	59	49	57	40
Church	10	19	26	49	29	36	73

Notes: Based on respondents interviewed. See notes to Tables 3-12 and 4-4.

Fourth, local oversight and official supervision matter. PNG's schools now have a mature, sustainable local governance structure, and a set of supervisory arrangements that are at least functioning, even if they could be improved upon. This is an achievement brought about by a decade or more of reform and effort. This report provides evidence that

these governance arrangements do make a difference, and that schools that have more active BoMs and P&C Committees are of a higher quality. There is also evidence that supervision matters, with schools that have more visits from a Standards Officer performing better.

Fifth, there does seem to be a difference between the performance of church and government schools and health clinics, with the former outperforming the latter on a range of levels.

Sixth, there are large new funding sources available through constituency funds controlled by MPs, but little is reaching schools and health clinics, and whatever is reaching them is often not well managed.

Seventh, the neglect of maintenance is still a significant problem.

Eighth, there are significant provincial differences. The quality of provincial governance clearly matters, and there are many lessons to be learnt from what the better performing provinces do.

Ninth, both the health and the education sectors face significant, but quite different, workforce challenges. For education, it is a matter of hiring more teachers to keep up with growing enrolments; for health it is a matter of revitalising an aging workforce, and addressing worker grievance.

Tenth, we see an encouraging gender transformation in these two sectors at both the working level (teachers and health workers) and the management level (Head Teachers and OICs). There are now more female teachers and health workers than male. Also, while there are still more boys than girls enrolled in school, this gap has been significantly reduced.

9.7 Recommendations

We will be following up on this survey with a series of case studies. Once those findings are in, we will be in a better position to develop detailed policy recommendations. Nevertheless, some clear messages already emerge from our findings.

Implications for primary health

Turning around the performance of the health sector will not be easy. But it is not all doom and gloom. Much can be learnt from the better performing provinces.

The first challenge is to get more external support to clinics, so that they become viable centres of support rather than ghost clinics unable to deliver even basic services. This will require greater budget allocations, but also new ways to get funds to clinics. Chapter 6 discussed several options for this.

A direct funding pilot is underway in Bougainville, and has been evaluated positively (WHO and NDoH 2013), though it is still early

days. Local committees have been established to oversee use of the funds, as they do at schools.

A second option is the model that East New Britain uses, where operational funding for health clinics is channelled to the Local Level Government (LLG) health office. LLG health manager positions, which appear to be unique to East New Britain, have been established to ensure that clinics are well supported and have access to the resources they need to deliver services. Given East New Britain's health delivery performance (46 per cent of clinics in East New Britain conduct regular patrols compared to only 18 per cent across all eight provinces), this model also warrants further investigation.

There has been no suggestion yet that funds in lieu of user fees will be sent to clinics directly from the central government, as they are in the case of schools. But as long as funds pass through provincial governments, there is a real risk of diversion. This transmittal of funds directly from the national government to health clinics, or at least health centres, should also be considered.

Further investigation of all these options is required before a final recommendation can be made. This will be undertaken as part of the second phase of this research project. What is clear at this stage is that there needs to be a shift to ensure that greater funding reaches clinics, putting flexible resources at their disposal.

The second challenge is to strengthen local governance and supervision. The school BoM model is an obvious candidate for adoption by the health sector. It could be introduced through a pilot scheme. A sensible approach would be to introduce a single BoM for each health centre and the aid posts that the centre supervises. More resources for supervision are also required. One option would be to give school BoMs responsibility for their local health clinics. This would save time, and build on institutions that are already functioning. However, BoMs do have a legislative basis, and how additional health duties would be grafted on to them requires careful consideration.

The third challenge for the health sector is the range of workforce challenges it faces, from resolving pay disputes to regenerating an aging workforce. Addressing these issues will require expanding the health salary bill, and expanding the capacity of training institutions.

Finally, given the severity and multi-dimensionality of the problems faced by PNG's health sector, a phased approach is required. The initial reform focus should be on the larger, district-level facilities, such as rural hospitals. There is no point fitting up aid posts if they have no-one to transfer patients to. Indeed, some aid posts may need to be closed so that resources can be focused on larger clinics, with greater reliance being placed on health patrols.

Implications for primary education

PNG's schools have expanded greatly over the last decade, but now need to focus on quality. One of the key findings of this report is that the more effort teachers put into teaching the more likely communities are to send their children to school.

Supervision and local oversight are better in education than in health, but can certainly be improved. More resources are needed for supervision: the budget for this has actually fallen over the last decade, despite the sector's massive expansion. Smarter deployment of supervisory resources will also help, with more rotation to ensure that all schools are visited. Supervisors must also inspect school finances and spending when they arrive at schools. While most, though not all, schools do receive a supervisory visit, only a third get their subsidy payments checked annually, and it tends to be the same schools in successive years. Supervisory visits will need to increase over time, but in the meantime it is important that supervisors are carefully checking school books while at schools. Local oversight can also be strengthened by, for example, making sure BoMs have access to financial records.

More teachers are needed. Bearing in mind the large increase in revenues schools have experienced in recent years, hiring more teachers could, if necessary, be paid for by freezing, and perhaps reducing to better-off schools, subsidy payments.

The school subsidy bill is inflated by the link to enrolments. We have seen that the absenteeism rate has increased over the last decade. One likely reason for this is that Head Teachers have an incentive to inflate enrolment rates to maximize their subsidy payments. It may not be practical to link subsidy payments to actual attendance rates (although this could be a longer-term goal of the policy). But if inspections reveal a high level of absenteeism, school enrolment figures should be challenged.

Implications for service delivery

We end with five recommendations that apply equally to both health and education, and to service delivery more generally.

First, MP constituency funds need to be made to work better, in particular to reduce the number of projects that are never finished. For example, school DSIP projects could be given to school BoMs to manage.

Second, underfunding of maintenance remains a serious problem. All funding provided to facilities could include a minimum maintenance spending requirement to address this.

Third, given the importance of local oversight, empowering the local community is clearly an important challenge. Information is critical for

empowerment. We noticed through our surveys that little use is made in PNG of transparency mechanisms at the local level. Schools and clinics could be required to post on notice boards statements of the funds that they have received, and how these are being spent. The same should apply to DSIP-funded projects.

Fourth, the better performance of church-run schools and clinics make a strong case for shifting to greater reliance on church schools and health clinics through expanding existing partnerships, improving these partnerships, and learning from their relative success.

Fifth, and finally, monitoring matters. There is dearth of high-quality, trusted data in PNG. This survey fills a huge gap. Having two surveys that can "talk" to each other is a valuable asset, and the series should be further developed. Ten years is too long to wait for surveys such as this. Five years would be a better interval.

ACRONYMS

ANU Australian National University
AP Aid Post
BoM Board of Management
DISP District Services Improvement Program
EMIS Education Management Information System
GR Grade
HC+ Sub-health centres, urban clinics, health centres and rural hospitals
HEO Health Extension Officer
HIES Household Income and Expenditure Survey (2009-10)
JPPBPC Joint District Planning Budget Priorities Committee
K Kina
LLG Local-Level Government
LLGSIP Local-Level Government Service Improvement Program
NCD National Capital District
NDoE National Department of Education
NDoH National Department of Health
NEFC National Economic and Fiscal Commission
NGO Non-governmental organisation
NRI National Research Institute
OBE Outcomes Based Education
OIC Officer in Charge (at health clinics)
OLPG Organic Law on Provincial Government
OLPGLLG Organic Law on Provincial Governments and Local Level Governments
OLS Ordinary Least Squares
P&C Parents & Citizens
PEB Provincial Education Board
PEPE Promoting Effective Public Expenditure survey (2012)
PESD Public Expenditure and Service Delivery survey (2002)
PHA Provincial Health Authority
PNG Papua New Guinea
PSIP Provincial Services Improvement Program
SIP Service Improvement Program
TFF Tuition Fee-Free (policy)
TSC Teaching Service Commission
VHC Village Health Committee
WHO World Health Organisation

REFERENCES

Asia South Pacific Association for Basic and Adult Education (ASPBAE) Australia 2011, *PNG education experience survey and literacy assessment: a report on five provinces*, ASPBAE Australia. <http://www.aspbae.org/sites/default/files/pdf/PNG%20Education%20Experience%20Survey%20and%20Literacy%20Assessment.pdf>.

Australian Agency for International Development (AusAID) 2002, *Annual report 2001-2002*, Commonwealth of Australia, Canberra. <http://aid.dfat.gov.au/AnnualReports/Pages/rep02default.aspx>.

—— 2010, *Australian support for basic and secondary education in Papua New Guinea, 2010-2015: delivery strategy*, AusAID, Canberra. <http://aid.dfat.gov.au/countries/pacific/png/Documents/png-education-strategy.pdf>.

—— 2012, *Annual report 2011-2012*, Commonwealth of Australia, Canberra. <http://aid.dfat.gov.au/AnnualReports/Pages/rep12default.aspx>.

Bleich, SN, Özaltin, E, & Murray, CJ 2009, 'How does satisfaction with the health-care system relate to patient experience?', *Bulletin of the World Health Organization*, *87*(4), pp. 271-278.

Cairns, A 2014, 'Below the glass floor', *Development Policy Blog*, viewed 1 July 2014. <http://devpolicy.org/below-the-glass-floor-20140527/>.

Department of Implementation and Rural Development 2013, *Provincial Services Improvement Program, District Services Improvement Program, Local Level Government Services Improvement Program Administrative Guidelines*, Port Moresby: Papua New Guinea.

Department of Provincial and Local Government Affairs (DPLGA) 2009, *Case study of district and facility funding*, [District Case Study] report presented to the provincial and local-level Service Monitoring Authority, DPLGA, Port Moresby.

Filmer, D 2008, 'Lessons from school surveys in Indonesia and Papua New Guinea', in S Amin, J Das & M Goldstein (eds), *Are you being served? New tools for measuring service delivery*, World Bank, Washington DC, pp. 221-232.

Government of Papua New Guinea 2010, *National health plan 2011–2020: volume 1, policies and strategies*, National Health Plan Secretariat, Strategic Policy Division, National Department of Health (NDoH), Government of Papua New Guinea, Waigani NCD. <http://www.wpro.who.int/countries/png/PNGNHP_Part1.pdf>.

Government of Papua New Guinea 2013, *2013 Sector Performance Annual Review: Assessment of Sector Performance 2008 – 2012* (Vol. July), Government of Papua New Guinea, Waigani NCD.

Gurkan, A, Kaiser, K & Voorbraak, D 2009, 'Implementing public expenditure tracking surveys for results: lessons from a decade of global experience', *PREM Notes*, no. 145. Public Sector, World Bank, Washington DC. <http://documents.worldbank.org/curated/en/2009/11/11683621/implementing-public-expenditure-tracking-surveys-results-lessons-decade-global-experience>.

Guy, R, Paraide, P, Kippel, LM & Reta, M 2003, *Wok bung: a qualitative study of twelve primary schools in Papua New Guinea,* National Research Institute, Waigani, NCD.

Hickey-Tshangana, A 2010, *Constituency development funds: scoping paper*, International Budget Partnership, <http://internationalbudget.org/wp-content/uploads/Constituency-Development-Funds-Scoping-Paper.pdf>.

Inder, B, Spinks, J, Srivastava, P & Sweeney, R 2011, *Papua New Guinea: modelling costs and efficiency of primary health care services in Papua New Guinea*, Centre for

Health Economics, Faculty of Business and Economics, Monash University, Research Paper 2011:70.
<http://www.buseco.monash.edu.au/centres/che/pubs/researchpaper70.pdf>.

International Monetary Fund (IMF) 2013, *Solomon Islands: first review under the extended credit facility arrangement—staff report; press release on the executive board discussion; and statement by the Executive Director for Solomon Islands*, IMF country report no. 13/249, IMF Publications, Washington DC.
< http://www.imf.org/external/pubs/cat/longres.aspx?sk=40852.0>.

Islands Business 2013, 'PNG education in crisis: report', *Islands Business* (online edition), viewed 3 July 2014.
<http://www.islandsbusiness.com/news/papua-new-guinea/2349/png-education-in-crisis-report/>.

Ketan, J 2007, *The Use and Abuse of Electoral Development Funds and their Impact on Electoral Politics and Governance in Papua New Guinea,* CDI Policy Papers on Political Governance 2007/2. Centre for Democratic Institutions, The Australian National University, Canberra.

Kiala, W 2014, 'OBE out in 2015' *Post Courier*, 15 July, p.1.

National Department of Education (NDoE) 2004, *Achieving a better future: a national plan for education 2005-2014*, NDoE.
<http://www.education.gov.pg/QL_Plans/plans/national-education-plan-2005-2014.pdf>.

—— 2009, *Achieving universal education for a better future: universal basic education plan 2010-2019* (December), National Executive Council.
<http://www.education.gov.pg/QL_Plans/plans/ube-plan-2010-2019.pdf>.

—— 2012a, *Fee free tuition policy management manual*, National Department of Education (NDoE).

—— 2012b, 'History', *National Department of Education* website, viewed 8 July 2014. <http://www.education.gov.pg/QL_History/index.html>.

National Economic and Fiscal Commission (NEFC) 2005, *Cost! Capacity! Performance! Review of all expenditure in 2005 by provincial governments*, NEFC, Port Moresby.

—— 2012, *"Step 2, the ripple effect": the 2010 provincial expenditure review – with trend analysis from 2005 to 2010,* NEFC, Port Moresby.
<http://www.nefc.gov.pg/assets/publications/per/Step2_RippleEffect.pdf>.

—— & National Department of Education (NDoE) 2013, *Go long ples: reducing inequality in education funding*, National Economic and Fiscal Commission (NEFC) and NDoE, Port Moresby.

National Statistical Office (NSO) 2013, *2009-2010 Papua New Guinea household income and expenditure survey: summary tables,* NSO, Port Moresby.

Nordstrum, LE 2013, 'A Sisyphean complex? Economic and cost constraints in filling teacher quantity and quality gaps' in RE Moon (ed) *Teacher education and the challenge of development: a global analysis*, Routledge, London, pp. 32-50.

Piel, J, Kirkwood, B, Howse, G, Assenheim, V & Glastonbury, I 2013, *Christian Health Services: technical assistance mission report,* mimeo.

Post Courier 2011, 'O'Neill: work has begun', *Post Courier*, 10 August, p. 1.

Regan A, 1991, 'The legal framework for decentralisation of health functions', in Thomason, JA, Newbrander, WC, & Kolehmainen-Aitken, RL *Decentralization in a developing country: the experience of Papua New Guinea and its health service*. National Centre for Development Studies, Australian National University, pp. 36 – 53.

Rena, R 2011, 'Challenges for quality primary education in Papua New Guinea: a case study', *Education Research International*, vol. 2011, pp. 1-11.

Salmang, GA 2013, 'OBE not relevant to PNG context, syllabus', *Post Courier*, 11 December, p. 3.

Sweeney R & Mulou N 2012, 'Fee or free? Trading equity for quality of care for primary health care in Papua New Guinea', *International Health*, vol. 4, pp. 283-288. <http://inthealth.oxfordjournals.org/content/4/4/283.abstract>.

Sundet, G 2008, 'Following the money: do public expenditure tracking surveys matter?', *U4*, no. 2008:8, U4 Anti-Corruption Resource Centre, Christian Michelsen Institute, Norway, <http://www.gsdrc.org/go/display&type=Document&id=3581>.

Tapo, MF 2004, 'National standards / local implementation: case studies of differing perceptions of national education standards in Papua New Guinea', PhD Thesis, Faculty of Education, Queensland University of Technology. <http://eprints.qut.edu.au/15919/>.

Thomason, J & Kase P 2009. 'Policy Making in Health' in *Policy Making and Implementation: Studies from Papua New Guinea,* ed. R. J. May, pp. 117-130. ANU EPress.

World Bank & National Research Institute (NRI) 2004, *Papua New Guinea: public expenditure and service delivery (PESD)* (30 June), World Bank and NRI. *<microdata.worldbank.org/index.php/catalog/62/download/13449>.*

World Bank, Australian Agency for International Development (AusAID) & Asian Development Bank 2007, *Strategic directions for human development in Papua New Guinea*, World Bank, Washington DC. <http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-6987-6>.

World Bank 2009, *Abolishing school fees in Africa: lessons from Ethiopia, Ghana, Kenya, Malawi and Mozambique*, World Bank, Washington DC. <http://documents.worldbank.org/curated/en/2009/01/10474427/abolishing-school-fees-africa-lessons-ethiopia-ghana-kenya-malawi-mozambique>.

—— 2012, *PNG health workforce crisis: a call to action*, World Bank, Washington DC.

<http://documents.worldbank.org/curated/en/2012/11/17196799/papua-new-guinea-png-health-workforce-crisis-call-action>.

——, Australian Agency for International Development (AusAID) & National Economic and Fiscal Commission (NEFC) 2013, *Below the glass floor: analytical review of expenditure by provincial administrations on rural health from health function grants and provincial internal revenue*, World Bank, Washington DC. <https://openknowledge.worldbank.org/bitstream/handle/10986/17567/845210WP0v20Be0x382123B00PUBLIC0pdf.pdf?sequence=1>.

World Bank 2014, 'World DataBank: Papua New Guinea', viewed 4 June 2014. <http://databank.worldbank.org/data/views/reports/tableview.aspx#>.

World Health Organisation & National Department of Health (NDoH) 2012, *Health service delivery profile: Papua New Guinea 2012*, viewed 15 January 2014. <http://www.wpro.who.int/health_services/service_delivery_profile_papua_new_guinea.pdf>.

World Health Organisation & National Department of Health (NDoH) 2013, *Evaluation of direct health facility financing project*, NDoH, Port Moresby.

Has Papua New Guinea been able to translate its booming mineral wealth into services for ordinary people?

In 2012, the average school in PNG had 58 per cent more children enrolled, 34 per cent more teachers, and 22 per cent more classrooms compared to 2002. The average health clinic, on the other hand, saw 19 per cent fewer patients on a typical day, had the same number of staff, and 10 per cent less drug availability.

What accounts for the very different performance in education and health?

This report, part of the joint NRI-ANU Promoting Effective Public Expenditure (PEPE) project, presents the results of a 2012 survey of 360 primary schools and health clinics across eight provinces, from the nation's capital to its most far-flung and inaccessible regions. Many of the same facilities were also surveyed at the start of the decade. By combining these two surveys, we can assess progress over time, and analyse the impact of important policy reforms.

The report not only documents but also explains these trends and the variable performance across facilities, provinces, and agency-types.

It shows that development progress is possible in PNG, but that it requires much more than a growing budget. Local oversight, effective supervision, good financial management and a motivated workforce are also important.

This report, and the unique data set on which it is based, will be an invaluable resource for PNG's policymakers and people.

FOR MORE INFORMATION

nri.org.pg
devpolicy.anu.edu.au

DOWNLOAD THE REPORT

devpolicy.anu.edu.au/png-budget-project