

## Appraisal of Preparedness Planning for Healthcarers As to Pandemic Influenza in Taiwan

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### Abstract

To investigate the preparedness in avian influenza and its relation with psychological stress, we assessed the staffs in a university-teaching hospital in January 2004. The study population included medical physicians, nursing staffs, administrative staffs, and medical technicians. The questionnaire for avian influenza preparedness was modified form ASTHO checklist. There were 53 items to be investigated. The main categories include (1) legal and policy issues; (2) authority; (3) vaccination/antivirals; (4) surge capacity; (5) communications and education; (6) laboratory and surveillance. In addition, the emotional stress was assessed by a stress test that ranges from 0 points to 110 points. The psychological background was set if the avian influenza is coming in the near future. The overall average scoring for ASTHO checklist was  $19 \pm 6$  points (95% CI 13-24). The scoring was  $20 \pm 7$  points (95% CI 13-26) for nursing staffs,  $19 \pm 7$  points (95% CI 12-26) for medical physicians, and  $21 \pm 6$  points (95% CI 14-27) for administrative staffs. There was no significant difference among three groups. The correlation between emotional stress and preparedness is moderate ( $r^2=0.59$ ,  $P < 0.0001$ ). For each group, the similar findings were confirmed (data not shown). This study demonstrated that a substantial portion of health care staffs still did not know well the pandemic plans and thus had psychological barrier in management of avian influenza pandemics. (*Ann Disaster Med.* 2004;2:47-59)

**Key words:** Avian Influenza; Pandemics; Preparedness

### Introduction

In recent years, emerging infectious diseases and re-emerging infectious diseases have become important issues in disaster medicine. The problems have also become big challenges for state and local officials worldwide. There has been a major global outbreak of severe acute respiratory syndrome (SARS) in 2003.<sup>1-4</sup> Many researchers tried to find optimal methods to improve the diagnosis and treatment of the

disease.<sup>3-14</sup> Besides SARS, there are still many other emerging infectious diseases such as West Nile encephalitis, Chaus-Jacod disease, influenza and avian influenza.

In 1918, the Spanish flu has caused an epidemic influenza. However, there seemed to be no definite preparedness for re-emergence of pandemic influenza in the past century. It remains a challenge to convey the potential severity of a pandemic to key law and

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policymakers, as well as individuals in the medical and public health communities. However, according to research data, most of the countries, even in the United States, are still not well prepared. ASTHO demonstrated that limited funds have been made available for pandemic planning. And the United States are in various stages of readiness for a public health crisis that could potentially last more than a year. They then suggested that preparedness for bioterrorism be a good opportunity for health agencies to initiate or continue development of a well-established pandemic response plan.

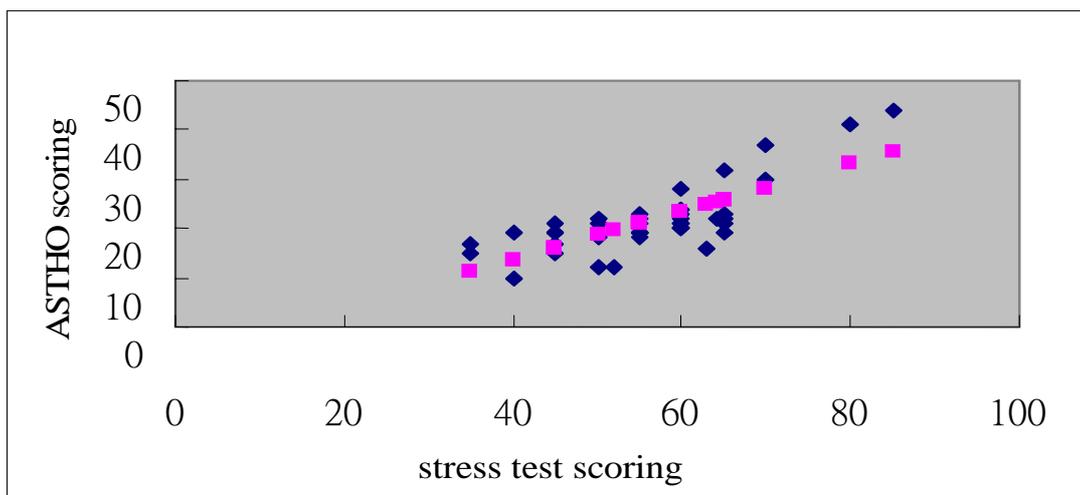
During a pandemic, health officials should be health authorities who assert good leadership to exercise and maintain medical resources for public health. To accomplish such an objective, all of the healthcarers ought to be familiar with pandemics response planning, exercise of incident command system, estimation of surge capacity, and inter-agency cooperation and communication. ASTHO thus designed a checklist for health officials to elucidate if the

response planning was well-prepared. We then investigate the preparedness of a local health agency by applying a checklist developed by ASTHO as follows.

## Methods

### *Study population and questionnaire*

The study hospital is a university-teaching hospital with 921 beds and a reference population of about 800,000. The study was conducted from October 2003. The study population included medical physicians, nursing staffs, administrative staffs, and medical technicians. The questionnaire for avian influenza preparedness was modified form ASTHO checklist. For each term, there were scoring systems from 0 to 5 implying the degree of recognition. In other words, the score "0" meant completely no idea whereas the score "5" full understanding. There were 45 items to be investigated (Table 1). The main categories include (1) legal and policy issues; (2) authority; (3) vaccination/antivirals; (4) surge capacity; (5) communications and



**Figure.** Linear regression depicting correlation between stress test scoring and ASTHO checklist scoring

education; (6) laboratory and surveillance. Any problems of understanding the items will be answered by a well-trained medical staff during the interview. At the end of the questionnaire, the supplemented question is "Are you afraid of pandemic attack of avian influenza?" with the same scoring system to be checked. The scoring for each "Yes" is given 1 point whereas that for each "No" 0 point.

In addition, the emotional stress was assessed by a stress test that ranges from 0 points to 110 points. The psychological background was set if the avian influenza is coming in the near future.

### **Statistical analysis**

All the data were processed and analyzed with Microsoft Excel 2000 for Windows. The techniques applied to data analysis included descriptive statistics generating and independent samples *t*-test and chi-square test. A linear regression model was used to examine the correlation between emotional stress and the degree of preparedness.

## **Results**

### **Preparedness for avian influenza**

Two hundreds questionnaires were delivered and 172 final complete answer sheets of ASTHO checklist were obtained. The received rate was 86%. Among 172 completed questionnaires, 37 were from medical physicians, 115 from nursing staffs, and 20 from administrative staffs.

The overall average scoring for ASTHO checklist was  $19 \pm 6$  points (95% CI 13-24). The scoring was  $20 \pm 7$  points (95% CI 13-26) for nursing staffs,  $19 \pm 7$  points (95% CI 12-26) for medical physicians, and  $21 \pm 6$  points (95% CI

14-27) for administrative staffs. There was no significant difference among three groups. The most presence of positive result ("Yes") is the item "50. The emergency response system is ready to deal with epidemic AVIAN INFLUENZA as called for in an all-hazards or epidemic plan." (totally 110 "yes") whereas the item "3. I have reviewed with legal counsel my jurisdiction's laws and procedures on quarantine, isolation, closing premises and suspending public meetings and know how to implement them to help control an epidemic." (totally 12 "yes").

### **Relationship between preparedness and emotional instability**

As illustrated in Figure, the correlation between emotional stress and preparedness is moderate ( $r^2=0.59$ ,  $P<0.0001$ ). For each group, the similar findings were confirmed (data not shown). In other words, those presenting with self-confidence in avian influenza preparedness had less psychological stress.

## **Discussion**

This study demonstrated that a substantial portion of health care staffs still did not know well the pandemic plans and thus had psychological barrier in management of avian influenza pandemics.

The recent avian influenza outbreaks in Asia suggested that another influenza pandemic be inevitable and possibly imminent. Epidemiological models project that an influenza pandemic will be responsible for major disease burden and significant economic costs both in developed and developing countries. The impact in poor countries is likely to be greatest, due to limited health care resources and poor

health and nutritional status of the population. Clearly, the most important immediate intervention is to contain as rapidly as possible the current avian influenza emergency, thereby reducing the likelihood of the emergence and spread of a new pandemic virus.<sup>15</sup>

Implementing measures for the containment of the spread of an influenza pandemic virus and reducing its burden on the population will require time and a major coordinated global effort. During the initial phase of an influenza outbreak with pandemic potential, efficient surveillance, focused and timely public health measures may slow down the national and international spread of the virus, thereby buying precious time for global pandemic response measures to be implemented.<sup>16</sup>

Avian influenza has been mentioned as a "natural terrorism". Lessons learned from the annual influenza season, pandemic history, and the 2001 anthrax attacks underscore four key reasons for state health officials to gain advance understanding of their role during an influenza pandemic and address preparedness at this time.<sup>17</sup> While an early warning for a terrorist attack is unlikely, the warning already exists for an influenza pandemic. Most public health experts expect that it will happen again. The morbidity and mortality resulting from an influenza pandemic may far outweigh that caused by a bioterrorist attack, with an estimated 89,000-207,000 deaths, 314,000-734,000 hospitalizations, 18-42 million doctor visits, and 20-47 million additional cases who do not seek formal medical care. The state health official will be looked to as the controlling health authority by the public, governor, and legislature, and will need to assert significant leadership to mobilize and sustain private and

public healthcare resources during an influenza pandemic. The substantial overlap between the public health infrastructure needed to address bioterrorism-related events and that which is needed to address naturally occurring outbreaks suggests now is an exceptional time to develop or evaluate state preparedness plans for an influenza pandemic

There have been many national influenza pandemic plans posted in WHO website.<sup>18</sup> The nations include Australia, Brazil, Canada, Hungary, Italy, Japan, Netherlands, New Zealand, Norway, Slovak Republic, South Africa, Switzerland, United Kingdom, and the United States. However, a significant portion of people do not know what the national pandemic plan is in our country. At least thirty-five states are in the process of developing state-specific pandemic plans, and twelve have completed draft plans. Some public health experts note that the plans adequately identify major issues surrounding an influenza crisis, but believe that each state's pandemic plan should explicitly outline a detailed course of action.

In spite of advance in medicine than last influenza pandemics, prediction of the onset of an influenza pandemic remains impossible. Preparation of control measures still take more time than is available before the pandemic strikes, and keeping stocks of anti-influenza drugs in amounts sufficient to treat whole population groups worldwide is unrealistic. Many countries lack sufficient resources to prepare appropriately for such an event. The increased volume and speed of international travel as well as the expansion of population in many regions and increased urbanization, will put additional severe constraints on the establishment and implementation of efficient control measures.

Nevertheless, it is hoped that from these accomplishments the odds have been dramatically improved in favor of finding novel viruses before pandemics have begun, thereby increasing the time to organize a response, including production and distribution of vaccines.

We believe that a national influenza centres need to be constantly alert for the existence of hard-to-identify viruses, and need to rapidly submit them with all information to one of the four WHO Collaborating Centres for Reference and Research on Influenza, so as to minimize time taken for their characterization. Co-operation between veterinary, public health and biological regulatory authorities is needed to respond quickly to cases of apparent animal-to-human spread of a severe form of influenza of a novel sub-type. Laboratories involved in influenza surveillance need to be equipped to handle a novel strain with due regard to prevention of infection of laboratory staff, and to prevention of release of the virus into the environment. Non-traditional tests may be needed to confirm cases of infection with a new sub-type when reagents for traditional diagnostic methods are not readily available, or traditional tests do not work well. A process involving continuous consultation among a wide variety of international experts is needed to evaluate laboratory and epidemiological data, when it is difficult to rapidly and reliably prove the lack of widespread person-to-person transmission of a novel sub-type.

Implementation of the response to a novel influenza must be highly credible, as resources will need to be rapidly diverted away from other efforts in order to focus on the threat. Hence, the appropriateness of responses should be reviewed continually by a group of knowledge-

able persons who represent a broad range of interests, from governmental and non-governmental sources. Our study revealed that the staffs in a university-teaching hospital had no confidence in good preparedness in avian influenza even after the episode of SARS last year. Hence the process of advance preparation of national strategies is likely to be ongoing, requiring further involvement of the government.

**Table 1.** ASTHO checklist

- \_ 1. My jurisdiction has a draft or formally adopted epidemic AVIAN INFLUENZA plan.
- \_ 2. Agreements have been obtained with my organization's health care insurers, Medicaid program, and healthcare product and service providers for cooperation with public health recommendations during an epidemic.
- \_ 3. I have reviewed with legal counsel my jurisdiction's laws and procedures on quarantine, isolation, closing premises and suspending public meetings and know how to implement them to help control an epidemic.
- \_ 4. I am familiar with my organization's medical volunteer licensure, liability, and compensation laws for in-organization, out-of-organization, returning retired, and non-medical volunteers.
- \_ 5. I know whether my organization allows hospitals and other licensed healthcare institutions to use temporary facilities for provision of medical care in the event of a public health emergency.
- \_ 6. My jurisdiction's epidemic plan addresses Worker's Compensation and Unemployment Compensation issues related to health care and other workers missing work because of isolation or quarantine.
- \_ 7. I have identified any deficiencies in my

jurisdiction's laws and procedures on quarantine, isolation and related capacities and initiated steps to have those deficiencies corrected.

\_ 8. I know what provisions are in place, if any, for compensation of persons with economic or health injury resulting from needed AVIAN INFLUENZA control measures and for limitation of liability of health care providers and agencies.

\_ 9. My organization has an executive AVIAN INFLUENZA epidemic planning committee that oversees the planning process, in cooperation with local health agencies.

\_ 10. My organization has identified the authority responsible for declaration of a public health emergency and for officially activating our plan during a AVIAN INFLUENZA epidemic.

\_ 11. My jurisdiction has identified key stakeholders responsible for development and implementation of specific components of the AVIAN INFLUENZA epidemic plan, including enforcement of isolation, quarantine, and closure and decontamination of premises.

\_ 12. My jurisdiction's elected officials, appointed officials, and other agency heads know their respective responsibilities in the event of an epidemic.

\_ 13. My jurisdiction has a command system in place (e.g., the Incident Command System) to govern roles and responsibilities during a multi-agency, multi-jurisdictional event.

\_ 14. I am familiar with the controlling authority over intraorganization and interorganization modes of transportation, should these need to be curtailed during an epidemic (e.g., airplanes, trains, ships, highways).

\_ 15. My staff has relationships with health authorities of adjoining counties or organizations

and with federal agencies to ensure effective communication during a public health emergency.

\_ 16. My jurisdiction has identified an overall authority in charge of coordinating different medical personnel groups during an epidemic.

\_ 17. I know personally the key individuals from the organization and local authorities who will assist in maintaining public order and enforcing control measures, if needed, during an epidemic.

\_ 18. I am familiar with the procedure for enlisting the National Guard's assistance during a public health emergency.

\_ 19. I know how to access current recommendations on treatment of cases and prevention of transmission in the hospital, long-term care and home care settings.

\_ 20. My jurisdiction's emergency response planning has involved health care product and service providers to determine how to best prevent and control disease spread and manage the health care of the population during an epidemic.

\_ 21. I am familiar with the required protocol for securing needed emergency healthcare services and supplies during a public health emergency.

\_ 22. My jurisdiction has identified ways to augment medical, nursing, and other health care staffing to maintain appropriate standards of care during an epidemic.

\_ 23. My jurisdiction has identified ways to augment public health laboratory, epidemiology and disease control staffing to meet emergency needs and in the event public health workers are affected by an epidemic.

\_ 24. My jurisdiction has a process to recruit and train medical volunteers for provision of care and vaccine administration during a public

health emergency.

\_ 25. My jurisdiction has identified alternate facilities where overflow cases from hospitals and well persons needing quarantine away from home can be cared for and has developed processes with Emergency Medical Services to assess, communicate, and direct patients to available beds.

\_ 26. My jurisdiction has identified facilities for outpatient and inpatient care of children with AVIAN INFLUENZA and their families.

\_ 27. My jurisdiction's epidemic plan addresses the mechanics of how isolation and quarantine will be carried out, such as providing support services for people who are isolated or quarantined to their homes or temporary infirmary facilities and protection for workers providing these services.

\_ 28. My jurisdiction has a plan for ensuring that appropriate personal protective equipment, including N-95 or higher level respirators, is made available for persons whose job requires exposure to people with AVIAN INFLUENZA, and that needed training and fit-testing are provided.

\_ 29. My jurisdiction has a plan for dealing with mass mortality, including transportation and burial of bodies.

\_ 30. My jurisdiction has a plan for providing mental health services to mitigate the impact of a AVIAN INFLUENZA epidemic.

\_ 31. I have conveyed the importance of epidemic preparedness, and its overlap with bioterrorism preparedness, to my jurisdiction's chief executive and to other organization and local law and policy makers.

\_ 32. I know personally the key individuals from public health agencies, the medical community, and the political community with whom I will

need to communicate during an epidemic.

\_ 33. My jurisdiction has begun educating the public on epidemic AVIAN INFLUENZA to instill acceptance of the epidemic response (including quarantine and isolation) and to optimize public assistance during an epidemic.

\_ 34. My jurisdiction has opened a regular channel of communication and begun educating health care providers (including first responders) and their organizations and unions on epidemic AVIAN INFLUENZA (including diagnosis, treatment, and management of cases and contacts to prevent transmission).

\_ 35. My jurisdiction has opened a regular channel of communication and begun educating chief executive officers of health care organizations on epidemic AVIAN INFLUENZA (including management of patients in health care settings, health care worker protection, physical facility needs, voluntary or forced furloughs of exposed workers, etc.).

\_ 36. My jurisdiction has established a multi-component communications network and plan for sharing of timely and accurate information among public health and other officials, medical providers, first responders, the media and the general public.

\_ 37. My jurisdiction has begun identifying and planning to produce and provide education and information materials for media, providers, the public, and occupational groups whose duties may expose them to AVIAN INFLUENZA, in appropriate languages and in forms suitable for limited literacy populations.

\_ 38. Whoever is selected as the primary public spokesperson for my jurisdiction during an epidemic is ready to clearly and consistently answer the following types of questions:

\_ How is the AVIAN INFLUENZA-associ-

ated virus transmitted?

\_ How long are people infectious after they have AVIAN INFLUENZA?

\_ What is isolation? What is quarantine?

\_ What is the justification for isolation of cases and quarantine of contacts?

\_ What is the legal authority for isolation of cases and quarantine of contacts?

\_ What is the difference between a probable and a suspected AVIAN INFLUENZA case?

\_ Who should be tested for the AVIAN INFLUENZA-associated virus?

\_ What can members of the public do to protect themselves?

\_ In the event a vaccine or antiviral treatment become available, what specific priority groups might be vaccinated or treated first?

\_ 39. My jurisdiction has identified the most effective media to get messages out to the public during an epidemic (e.g., TV, radio, print media, internet, Web sites, hotlines).

\_ 40. My jurisdiction has planned how to coordinate organization, local, and federal public messages and ensure they are consistent and timely.

\_ 41. In the event of a AVIAN INFLUENZA epidemic, I will have available daily counts of key community health indicators, such as numbers of emergency department visits, hospital admissions, deaths, available hospital beds and staff, facility closings, numbers of contacts being traced and numbers under quarantine.

\_ 42. The public health laboratory that serves my jurisdiction can test for the AVIAN INFLUENZA-associated virus by serology and/or PCR.

\_ 43. My organization has identified those labs that can test for the AVIAN INFLUENZA-associated virus.

\_ 44. The public health laboratory that serves my jurisdiction has linked to clinical laboratories and provided training on the use of AVIAN INFLUENZA tests, biosafety, specimen collection, packing and shipping, and rule-out testing.

\_ 45. Public health laboratories in my organization have computerized record-keeping to help with data transmission, tracking, reporting of results to patients and facilities, and analysis during an epidemic.

\_ 46. My jurisdiction has determined how to assess and document the spread and impact of disease throughout the population, including special populations at risk (such as health care workers and first responders), during a AVIAN INFLUENZA epidemic, including enhancements to routine surveillance.

\_ 47. My jurisdiction has computerized record-keeping for cases, suspected cases, contacts, and persons under public health isolation or quarantine orders to help with data transmission, tracking and analysis during an epidemic.

\_ 48. My jurisdiction's epidemiology staff, in cooperation with other public health agencies, has the capacity to investigate clusters of AVIAN INFLUENZA cases, to determine how disease is being transmitted, to trace and monitor contacts, to implement and monitor quarantine measures, and to determine whether control measures are working.

\_ 49. My jurisdiction has plans for educating health care providers about recognition and reporting of AVIAN INFLUENZA, about the current case definition, and about sources of current information on all aspects of AVIAN INFLUENZA.

\_ 50. The emergency response system is ready to deal with epidemic AVIAN INFLUENZA

as called for in an all-hazards or epidemic plan.

\_ 51. My jurisdiction has carried out a community-wide epidemic AVIAN INFLUENZA table-top or field exercise, to train on and evaluate its epidemic plan.

\_ 52. Community partners such as hospitals, EMS services, law enforcement agencies, health care practitioners, environmental hygiene/ remediation services, news media, schools, and colleges know what part they are expected to play during an epidemic and are prepared to do so.

\_ 53. The law enforcement and court system in this jurisdiction are prepared to enforce isolation and quarantine orders and to promptly adjudicate appeals to public health orders, as provided by statute.

**Table 2. Stress test**

1. How have you been feeling in general?
  - o 5 In excellent spirits
  - o 4 In very good spirits
  - o 3 In good spirits mostly
  - o 2 I've been up and down in spirits a lot
  - o 1 In low spirits mostly
  - o 0 In very low spirits
2. Have you been bothered by nervousness or your "nerves"?
  - o 0 Extremely so - to the point where I cannot work late or take care of things
  - o 1 Very much so
  - o 2 Quite a bit
  - o 3 Some - enough to bother me
  - o 4 A little
  - o 5 Not at all
3. Have you been in firm control of your behaviour, thoughts, emotions. or

feelings?

- o 5 Yes, definitely so
  - o 4 Yes, for most part
  - o 3 Generally so
  - o 2 Not too well
  - o 1 No, and I am somewhat disturbed
  - o 0 No, and I am very disturbed
4. Have you felt so sad, discouraged, or hopeless, or had so many problems, that you wondered if anything was worthwhile?
    - o 0 Extremely so - to the point I have just about given up
    - o 1 Very much so
    - o 2 Quite a bit
    - o 3 Some - enough to bother me
    - o 4 A little bit
    - o 5 Not at all
  5. Have you been under or felt you were under any strain, stress, or pressure?
    - o 0 Yes, almost more than I could bear
    - o 1 Yes - quite a bit of pressure
    - o 2 Yes - some, more than usual
    - o 3 Yes - some, but about usual
    - o 4 Yes - a little
    - o 5 Not at all
  6. How happy, satisfied, or pleased have you been with your personal life?
    - o 5 Extremely happy - couldn't have been more satisfied or pleased
    - o 4 Very happy
    - o 3 Fairly happy
    - o 2 Satisfied - pleased
    - o 1 Somewhat dissatisfied
    - o 0 Very dissatisfied
  7. Have you had reason to wonder if you

- were losing your mind, or losing control over the way you act, talk, think, feel, or of your memory?
- o 5 Not at all
  - o 4 Only a little
  - o 3 Some, but not enough to be concerned
  - o 2 Some, and I've been a little concerned
  - o 1 Some, and I am quite concerned
  - o 0 Much, and I'm very concerned
8. Have you been anxious, worried, or upset?
- o 0 Extremely so - to the point of being sick, or almost sick
  - o 1 Very much so
  - o 2 Quite a bit
  - o 3 Some - enough to bother me
  - o 4 A little bit
  - o 5 Not at all
9. Have you been waking up fresh and rested?
- o 5 Every day
  - o 4 Almost every day
  - o 3 Fairly often
  - o 2 Less than half the time
  - o 1 Rarely
  - o 0 None of the time
10. Have you been bothered by any illness, bodily disorder, pain, or fears about your health?
- o 0 All the time
  - o 1 Most of the time
  - o 2 A good bit of the time
  - o 3 Some of the time
  - o 4 A little of the time
  - o 5 None of the time
11. Has your daily life been full of things that are interesting to you?
- o 5 All the time
  - o 4 Most of the time
  - o 3 A good bit of the time
  - o 2 Some of the time
  - o 1 A little of the time
  - o 0 None of the time
12. Have you felt downhearted and blue?
- o 0 All the time
  - o 1 Most of the time
  - o 2 A good bit of the time
  - o 3 Some of the time
  - o 4 A little of the time
  - o 5 None of the time
13. Have you been feeling emotionally stable and sure of yourself?
- o 5 All the time
  - o 4 Most of the time
  - o 3 A good bit of the time
  - o 2 Some of the time
  - o 1 A little of the time
  - o 0 None of the time
14. Have you felt tired, worn out, used up, or exhausted?
- o 0 All the time
  - o 1 Most of the time
  - o 2 A good bit of the time
  - o 3 Some of the time
  - o 4 A little of the time
  - o 5 None of the time
- NOTE: For the next four scales, the words at each end describe opposite feelings. Circle any number along the bar that seems closest to how you have felt generally during the past month.
15. How concerned or worried about your health have you been?

- o 10 Not concerned at all
  - o 8
  - o 6
  - o 4
  - o 2
  - o 0 Very Concerned
16. How relaxed or tense have you been?
- o 10 Very Relaxed
  - o 8
  - o 6
  - o 4
  - o 2
  - o 0 Very Tense
17. How much energy, pep, and vitality have you felt?
- o 10 Very energetic, dynamic
  - o 8
  - o 6
  - o 4
  - o 2
  - o 0 No energy at all, listless
18. How depressed or cheerful have you been?
- o 10 Very cheerful
  - o 8
  - o 6
  - o 4
  - o 2
  - o Very depressed

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