HEALTH WORKFORCE SUPPLY AND REQUIREMENTS PROJECTION MODELS

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OVERVIEW -- In 1992 the World Health Organization first commissioned the development of a micro-computer-based model (HRH) to project supply of and requirements for human resources for health. Designed to assist countries with the development of long-range (20-30 years) strategic human resource development plans, the HRH model makes it possible to test the likely effects of alternative scenario assumptions on HRH supply, requirements (including for specialists), costs, and on the production and distribution of several types of inpatient and ambulatory services. Planners and policymakers from more than 60 countries had received training in the model and it is starting to be applied in a number of them. In 1998 the HRH model, now in version 3.0, was joined by a new rather simpler model (HRHShort) designed to help planners with intermediate-range (5-15 years) projections and policies. Basic characteristics and outputs of the two models are summarized below.

COMMON FEATURES -- Both the HRH and HRHShort models:

- develop projections based entirely on user-defined inputs
- accommodate varying levels of data inputs depending on availability
- project supply up to 30 years and requirements to any year
- can test the likely economic feasibility of requirements projections
- take into account requirements for both the public and private sectors
- include optional modules for countries that wish to use them
- provide graphs and extensive summary data and indices to help with interpretation
- use split computer screens to visualize input effects on outputs
- provide context sensitive on-line help for all tables
- have task-specific icon buttons to facilitate data entry and management
- come with a simulated data file for use in demonstrations and training
- come with many utility tables to help with intermediate planning tasks
- come with supplementary written documentation
- are provided in VisualBaler spreadsheet software on three diskettes as run-time modules that require no application program, and may be freely and legally copied. They require MS Windows (3.xx or 95). By late 1999 they will also be available in Microsoft Excel.

The HRH model is available in English, Spanish and French, and the HRHShort model is available only in English.

SUPPLY MODEL -- The HRH model consists of a single spreadsheet with seven sections that accommodates up to five user-specified occupational categories. Thirty- and intermediate-year

projections are developed with losses calculated by either the detailed *cohort method* or simple *average annual loss rate method*. Additional spreadsheets can be used for additional categories. Each supply spreadsheet includes a section which combines data for all five categories and a simple test of economic feasibility. The HRHShort model integrates supply and requirements projections on the same spreadsheet and can accommodate up to 20 occupational categories. Losses are projected using the simpler average annual loss rate method. Both models project health worker numbers and ratios and instructor requirements, and can take into account cross-border (provincial or national) flows of personnel as well as of new graduates.

REQUIREMENTS MODEL -- The HRH model consists of a single spreadsheet with seven sections, and a second spreadsheet which makes it possible (1) to compare up to nine alternative requirements projections for the same health system, and (2) to combine multiple subnational requirement projections. The requirements model can accommodate up to 15 different occupational categories and takes into account five different types of work locations where health sector staff may be found, that is: public sector hospitals; public sector free-standing ambulatory clinics and centers; the private sector; public health institutions that do not provide clinical services (eg, Ministry of Health, National Institute of Health); and academic and training institutions. In addition to the numbers of health workers required by the scenario, optional outputs include the number of medical and nursing specialists, the per capita production of services, the urban-rural distribution of services, and the economic feasibility of the scenario. The HRHShort model can develop a requirements scenario for up to 20 occupational categories and offers three alternative methods of projection. The simple *ratio method* starts with a projection of doctors and then makes it possible to achieve a desired ratio of other occupational categories to doctors. The somewhat more complex *locations method* is similar to that used in the HRH model but requires less input data and produces less detailed outputs. For those wishing to plan based on a specified target for the production of health services, the *services utilization* method can be used. Both models provide a wealth of summary statistics to help users make realistic assumptions, locate errors, and interpret scenario projections.
