Human Resources for Health (HRH) Indicator Compendium

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Acronyms

HAF	HRH Action Framework
HRH	human resources for health
HRIS	human resources information systems
HRM	human resources management
IMR	infant mortality rate
M&E	monitoring and evaluation
QoC	quality of care
USAID	United States Agency for International Development
WHO	World Health Organization

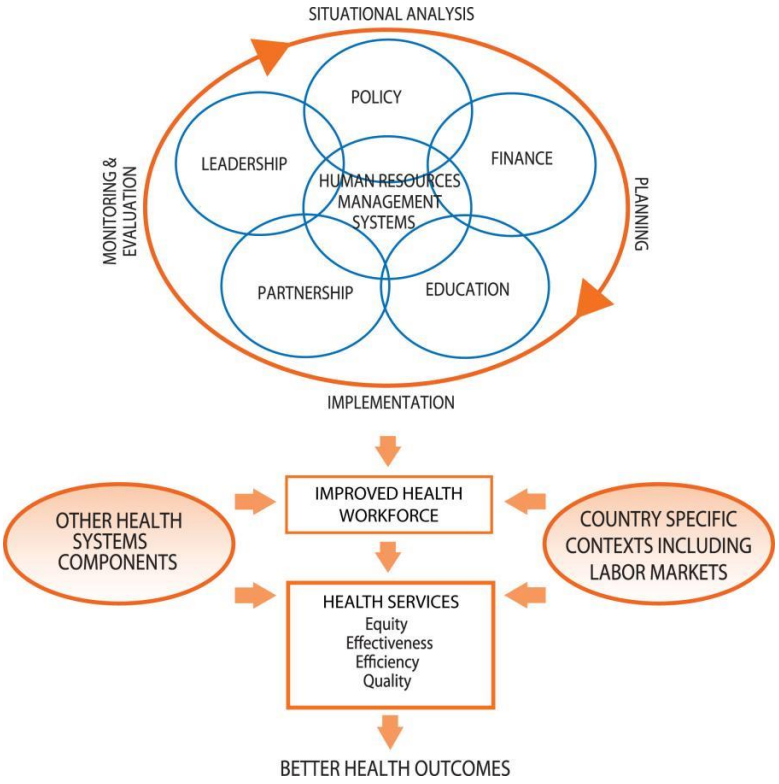
INTRODUCTION

The ultimate goal of strengthening health systems is to increase population access to quality health services, which will contribute to improved health outcomes. The health workforce is one of the elements of a health system whose improvement will help to reach this goal. Monitoring and evaluating the status and needs of the health workforce is a mandatory activity to track and measure progress and results in this area.

The heart of a monitoring and evaluation (M&E) system is its indicators. Human resources for health (HRH) indicators have not been as widely developed as for other health systems (e.g., service delivery, supply chain) (WHO 2009). The objective of this compendium is to provide a list of indicators for HRH systems strengthening practitioners interested in the M&E of HRH projects and programs.

As with every M&E system, indicators should follow a framework guiding the dimensions and elements contributing to the desired outputs and outcomes. The United States Agency for International Development (USAID) and the World Health Organization (WHO) supported the Global Health Workforce Alliance to develop an HRH Action Framework (HAF) to better describe and measure the dimensions contributing to improved HRH (See Figure 1).

Figure 1: The HRH Action Framework



The HRH Action Framework lays out key elements of HRH at the "macro," or country, level. There is interplay of leadership and partnerships, the status and outputs of the education sector, and the roles of finances and policies on the planning, production, distribution, and overall support of HRH, each linked with the existence of a human resources management system. These components benefit from a cycle of situation analysis and M&E that informs planning and implementation. The framework proposes that correct implementation of these dimensions will lead to an improved health workforce.

However, given that the leap from these higher "macro" levels to both an improved health workforce and improved health services seems large, the addition of two intermediate dimensions from human resources management (HRM) is proposed here.[1] As presented in Figure 2, these additional dimensions are a well-organized HRH "lifespan" and a "performance support and enabling environment."

The "lifespan" dimension (WHO 2006) includes the processes occurring from the registration and licensure of graduated students through their recruitment, deployment, and actions taken to promote them and improve their productivity, to their transition within the system or out of it, and to their eventual exit from the workforce (through retirement, migration, or death). The "performance support and enabling environment" dimension, on the other hand, includes those things that aid health workers in the completion of their day-to-day tasks, such as tools and guidelines for the job, trainings, and professional development activities. It also includes workplace conditions such as safety procedures, avenues for regular communication, compensation and incentives, and elements of supportive supervision. Both of these two additional dimensions invariably overlap and complement one another.

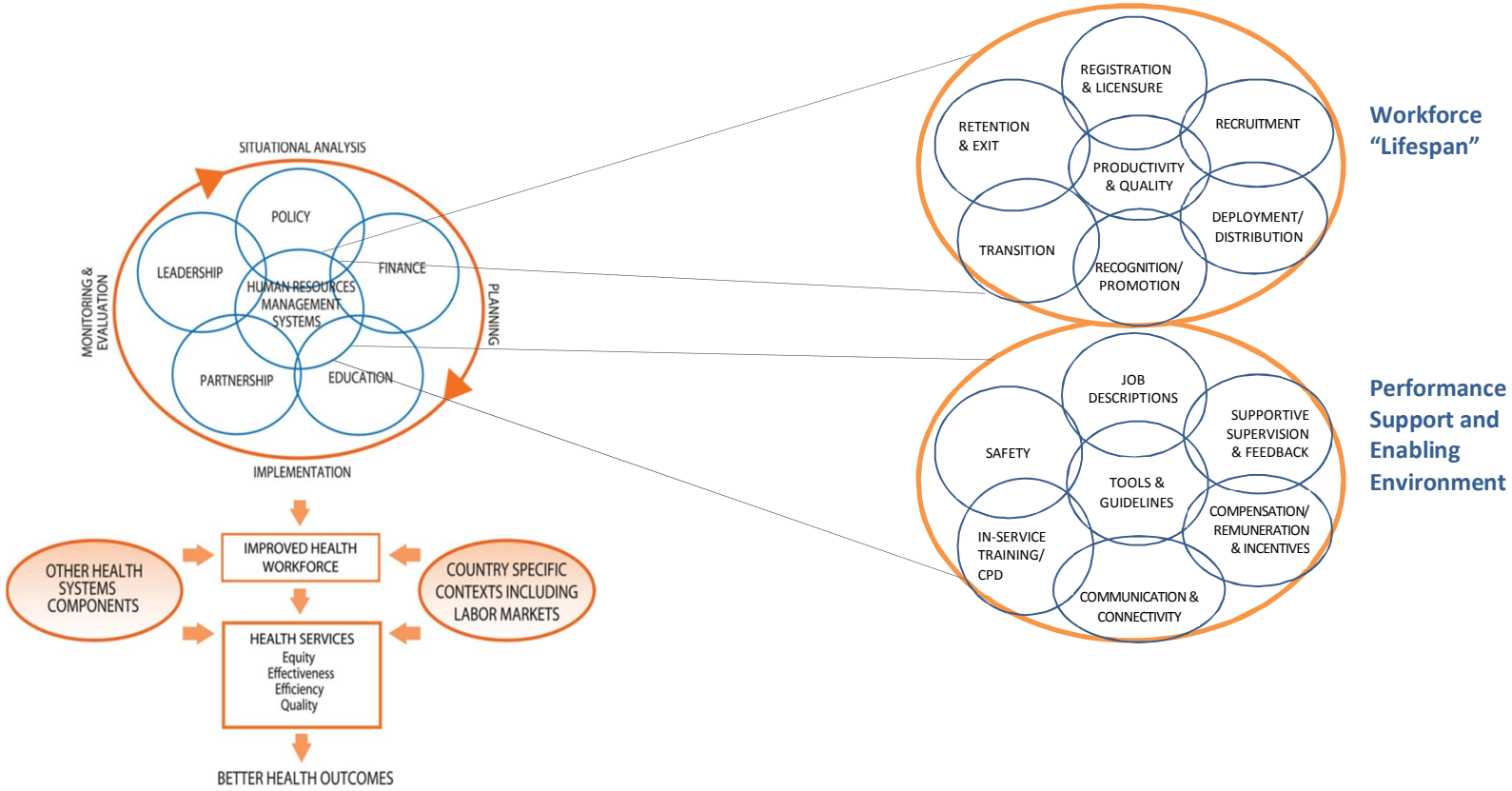
This compendium thus presents indicators based on the expanded framework described above. The indicators relate to different dimensions of HRH inputs, processes, outputs, and outcomes and can be quantified and measured over a designated period of time. For economy of space, there are a limited number of indicators included in each area. While far more extensive lists of HRH indicators are available, some of these indicators do not meet criteria for data quality, such as accuracy, reliability, completeness, precision, timeliness, and integrity, (MEASURE Evaluation 2007) and thus are not included. Also added to the list are a few new, suggested indicators, either arising from a forthcoming HRH Effort Index,[2] or postulated for relatively new areas of measurement. Additional indicators can also be found in Appendix 1: The basic basket of indicators of WHO's "Human resources for health (HRH) tools and guidelines."[3]

[1] See key components of HR management in Capacity*Plus*'s Human Resources Management Assessment Approach: http://www.capacityplus.org/files/resources/hrm-assessment-approach.pdf.

[2] The HRH Effort Index is an initiative of the Capacity*Plus* project to obtain indicators specific to seven dimensions of the HRH system: leadership and advocacy; policy and governance; finance; education and training; workforce lifespan; performance management; and M&E and information systems. See http://www.capacityplus.org/developing-hrh-effort-index-to-measure-country-level-status-in-hrh for more information.

[3] Download appendix from http://www.who.int/hrh/tools/planning/en/.

Figure 2: Expanded HRH Action Framework



Source: Adapted from initiative of the Global Health Workforce Alliance with support from USAID, WHO (see http://www.capacityproject.org/framework/)

Data Source Limitations

Many indicators require data sources that are currently not available in countries considered HRH "crisis" countries (WHO 2006) and where investments to strengthen HRH are being made. Examples include indicators based on data derived from population or facility surveys or functioning human resources information systems (HRIS). Lack of access to high-quality data represents a major barrier to the monitoring and evaluation of a wide range of health systems strengthening outputs and outcomes. This compendium is thus intended to serve as a user-friendly and practical resource for HRH practitioners, enabling them to select indicators that are appropriate and for which data can be obtained from reliable sources in each context.

Thematic Gaps

While measurements such as worker productivity and retention are more readily quantified, measurements pertaining to other context-specific areas such as management and partnership remain difficult to define and quantify. As a result, indicators for global leadership, HRH policy and planning, and workforce development are fewer and more qualitative than indicators for performance support.

Document Structure

This document presents indicators generally organized by the HAF and its expanded dimensions described above, followed by two appendices. The table of indicators provides, for each indicator, a name, description, method of calculation, and source of data, as well as notes or references. Appendix A provides information on the documents from which the indicators are drawn as well as additional reading resources. Appendix B provides examples of how different types of indicators, such as rates, indices, and ratios, are constructed.

COMPENDIUM OF HUMAN RESOURCES FOR HEALTH INDICATORS

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
1. Macro Level Indicators					
i. Leadership, Advocacy, and Partnerships					
1.	Political support for HRH	Extent to which elected officials in the country prioritize meeting HRH needs to strengthen the workforce by passing laws and regulations and sponsoring actions and policies aimed at improving the health workforce	Ordinal scale (1-10)[4]	Structured interviews at government/Ministry of Health level; observations and documentation review	From HRH Effort Index (see Fort, Burlew, and Deussom 2015)
2.	Strength of an HRH stakeholder leadership group	Extent to which a partnership of country-level HRH stakeholders (e.g., stakeholder leadership group or technical working group) operates, meets regularly, enacts policy or makes policy recommendations to senior management within the Ministry of Health	Ordinal scale (1-10)	Structured interviews at government/Ministry of Health level; documentation review	From HRH Effort Index. Consider if partnership is formalized (e.g., has terms of reference), meets at least twice a year, makes decisions, and contributes to HRH planning and policy-making
ii. Legal Framework					
3.	Conduciveness of legal framework to task-sharing/ shifting of HRH	Extent to which government/Ministry of Health has laws and policies allowing evidence-based task-sharing/shifting for new and/or existing cadres of health workers, to increase population access to health services	Ordinal scale (1-10)	Structured interviews at government/Ministry of Health level; documentation review	Illustrative. Consider if government uses updated research results and international evidence to expand range of tasks of certain cadres toward increased coverage of care
iii. Finance					
4.	Ratio of HRH development activities to payroll budget	Ratio of HRH budget allocated to development activities to payment of salaries and compensation	Numerator: Budget for HRH activities Denominator: Budget for HRH salaries and benefits	Data from office of finance (general Ministry of Health or HRH)	Illustrative. Ratio is typically a small fraction; should increase over time as there are more nonpayroll HRH activities

[4] For an illustrative view of the way the indicator is scored, see Appendix B, pages 22-23.

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
5.	Ratio of health sector workers' salary to other sectors' average salary	Ratio of average salary for health workers to other government workers (standardized)	Numerator: Average salary of health worker Denominator: Average salary of [other] government worker Breakdowns by cadre-occupation/age/sex/total[5]	Salaries from payroll offices in Ministry of Health and other sectors	Illustrative. Salaries to be standardized by type of profession/occupation, age, and sex distribution in sectors, as needed
iv. Gender					
6.	Distribution of health workers by sex	% of HRH by sex	Numerator: No. of female (or male) health workers Denominator: Total no. of health workers x 100	Data from a human resources information system (HRIS)	Data can be disaggregated by e.g., region, cadre, age, authority/management, and facility level to reveal inequalities in subareas
7.	Gender in preservice education policy	Existence of HRH preservice education policies, strategies, and plans that account for gender (to reduce inequality, discrimination, and harassment)	Composite indicator (index), made of policies to prevent discrimination in student admission; flexible study plans for mothers; policies against sexual harassment/ favors; gender balance of faculty and administrators; early child care facilities, etc.	Interviews, documentation review	Data can be disaggregated by e.g., region, cadre, age, authority/management, and school type (public/private) to reveal inequalities in subareas
v. Migration and Labor Market					
8.	Labor force activity rate	Proportion of HRH currently active in the labor force	Numerator: Number of persons with health-related skills active in the labor force Denominator: Total number of persons of working age with health-related skills	Census; labor force or household surveys	From WHO M&E HRH Handbook (see WHO 2009)
9.	Health worker unemployment rate	% of unemployed who are health workers, by cadre	Numerator: No. of unemployed health workers (by cadre) Denominator: Total no. of unemployed population	Labor surveys	From WHO M&E HRH Handbook
10.	Migration status	Proportion of foreign-born health workers in the total health workforce	Numerator: Number of health workers who were born in a	Census, labor force or other household surveys,	Adapted from Biomedcentral, n.d.

[5] For an illustrative view of the way the indicator may be constructed, see Appendix B, page 26.

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
			foreign country Denominator: Total number of health workers	facility/provider surveys, HRIS, routine records, special studies on migration (registries of work permits/entry visas)	
2. Specific Programmatic Area Indicators					
i. Health Workforce Policy					
11.	National HRH plan	Extent to which there is a current, comprehensive, strategic national HRH plan that outlines policies, laws, and regulations for the health workforce in alignment with country needs	Ordinal scale (1-10)	Structured interviews at government/Ministry of Health level; observations and documentation review	From HRH Effort Index. Consider whether the plan defines a vision; includes multiyear strategies, annual timelines, and implementation plans; is evidence-based; has indicators to measure progress; and considers the labor market
12.	Health workforce remuneration	Extent to which the government has established and abides by health worker remuneration guidelines that are competitive with other public and private sector jobs requiring similar levels of education, offer health workers a living wage, and are tied to scopes of practice	Ordinal scale (1-10)	Structured interviews at government /Ministry of Health level; observations and documentation review	From HRH Effort Index. Consider whether the guidelines and budget address workforce lifespan from recruitment to retirement; salary by cadre, specialization, location, and risk; benefits (e.g., health, retirement, severance) and incentives; regulations for dual practice; adequate, timely pay; equal pay for equal work
ii. Human Resources Planning					
13.	Stock (and density) of HRH	Total numbers and ratio of number of skilled health workers relative to population	Numerator: No. of health workers (by cadre) Denominator: Total population (in country, region, or district)	HRIS, surveys, and population census	From WHO M&E HRH Handbook; can be adapted to include more categories of workers,

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
			x 10,000 population		e.g., nonprofessional and community health workers
14.	Distribution of health workforce	% of health workers by rural/urban, region, age, cadre, sector	Numerator: No. of health workers in rural areas (or by other characteristics) Denominator: Total no. of health workers[6] Breakdowns by age groups/ cadre/sector (e.g., public, private)	HRIS	From WHO M&E HRH Handbook
15.	Skills mix	Distribution of HRH by occupation, specialization, or other skill-related characteristic	Numerator: Number of physicians, nurses and midwives (or other categories of health service providers) Denominator: Total number of health workers	Census, labor force or other household survey, representative facility/ provider surveys, routine records (HRIS)	From WHO M&E HRH Handbook
16.	Vacancy rates	% of HRH positions that have not been filled	Numerator: Total no. of unfilled HRH positions Denominator: Total no. of positions	HRIS	From Evaluation of Malawi Emergency HR Program (see Management Sciences for Health 2010)
3. Human Resources for Health Information Systems					
17.	Existence and capacity of a human resources information system (HRIS)	Extent to which the government has an information system that collects and maintains data on public sector staffing vacancies, staffing needs, and employment actions (e.g., deployments, transfers, promotions, leave, disciplinary actions, performance evaluations, exits) and status of health workers within the country by cadre, region, and facility	Ordinal scale (1-10)	Observations and documentation review	From HRH Effort Index
4. Health Workforce Lifespan					
i. Preservice Education					
18.	Capacity of educational	No./% of educational institutions that are accredited by a recognized	Accreditation includes sound business plan and financial	Observations and documentation review	From WHO M&E HRH Handbook

[6] For an illustrative view of the way the indicator is constructed, see Appendix B, pages 28-29.

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
	institutions	accreditation body	viability; faculty qualifications; student/faculty ratio; gender policy; curricula alignment with national health policies; quality assurance mechanisms; tracking of student progress and dropouts; merit- and need-based scholarships/subsidies		
19.	School attrition (dropout) rate	% of students (by school, cadre, gender, socioeconomic characteristics, reason) who drop out from school by end of first and last program year[7]	Numerator: No. of dropout students (by characteristics) Denominator: Total no. of students who registered/ started program x 100	School records, national Ministry of Health, Ministry of Education registries	Adapted from WHO M&E HRH Handbook
20.	Density of graduate types per population	Density of graduates by characteristic (e.g., ethnicity, language, origin [rural/ urban, region]) by their specific subpopulation	Numerator: Characteristics compiled from school graduate tracking Denominator: Characteristics as of total population estimated from population censuses[8] x 10,000 population	School records, population censuses	Similar to density of workers per population (see WHO 2006)
21.	Costs of training	Average health training cost per student	Numerator: Total costs (fixed and renewable) for a given academic program at health training institutions Denominator: Total number of students enrolled in the same academic program at health training institutions	Surveys or routine records of health training institutions	From Biomedcentral, n.d.
ii. Registration and Licensure					
22.	Registration and licensure of health workers	% of health workers professionally certified/licensed, per cadre, nationality, and other characteristics	Numerator: No. of certified/licensed health professionals (by characteristics) Denominator: Total number of	HRIS, records from professional licensing bodies, from HRH information systems (Ministry of Health,	From WHO M&E HRH Handbook. Aim is to achieve 100% by facilitating licensure, enforcing regulations,

[7] "Reason" includes failure to pass, personal/family, absenteeism, etc.

[8] For an illustrative view of the way the indicator may be constructed, see Appendix B, page 24.

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
			health workers	private/NGOs/faith-based organizations)	and empowering communities (e.g., through access to worker licensure status)
iii. Recruitment					
23.	Effectiveness (and transparency) of health workforce recruitment strategies	Extent to which health workforce recruitment strategies exist and are implemented to attract qualified graduates and professionals to fill vacant health worker positions (especially in rural, remote, and underserved areas) and utilize standard and transparent practices including equal opportunity	Ordinal scale (1-10)	Special interviews (with applicants and recently employed workers), document review	From HRH Effort Index. Consider whether the strategies are standardized (e.g., are advertised publicly, are based on job descriptions, are merit-based with clear selection criteria, are not politically influenced); prioritize nondiscrimination; are efficient; and use evidence-based strategies such as a rural pipeline policy.
iv. Retention and Exit					
24.	Workforce loss ratio (turnover rate)	Ratio of exits from health workforce (by e.g., cadre, region, gender, reason for leaving) to active workforce. As per WHO M&E HRH handbook, exit reasons could include education, family care/emergency, out-migration, retirement, disability, death	Numerator: No. of health workers who left active labor force in the last year (by characteristics) Denominator: Total no. of active health workers	HRIS	From WHO M&E HRH Handbook. Should be kept low. Could have benchmarks or thresholds over which a red flag would be raised. Can be used to gauge discontent of work by special cadres or in specific work environments (e.g., rural areas)
v. Productivity and Quality					
25.	HRH unemployment rate	Proportion of HRH currently unemployed (over a given period)	Numerator: No. of persons with health-related skills currently unemployed Denominator: Total no. of	Censuses and surveys (labor market surveys or national health accounts surveys)	From WHO M&E HRH Handbook.

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
			persons with health-related skills x 100		
26.	Absenteeism	Days and hours (and %) of absenteeism among health workers, by e.g., cadre, facility, region, reason.	Numerator: No. of hours daily or days monthly of employee absences from health workplace (by characteristics) Denominator: Total no. of scheduled working hours/days among employees over same period in same place x 100[9]	Time-motion studies	Adapted from WHO M&E HRH Handbook. Difficult to conduct. Needs observation and follow-up of selected health workers over a period of time; sensitivity issues (e.g., valid vs. invalid reasons for absence)
27.	Provider productivity (output index)	Ratio of consultations/services to health worker costs or defined period of time, per facility	Numerator: No. of specific consultations/services performed over a given period (e.g., out-patient or ambulatory visits, immunizations, surgeries) by a given/all health workers Denominator: total costs of health worker(s) or total number of working hours of health worker(s)	Facility/health worker surveys; time-motion studies	Illustrative. Difficult to conduct. Needs observation and follow-up of selected health workers over a period of time; sensitivity issues (e.g., valid vs. invalid reasons for conducting fewer visits/consultations)
28.	Quality of care index	Average quality of care by cadre, facility type, region	Composite indicator (index) made of (illustrative):[10] greeting; history-taking; examinations; explanations; finalization and follow-up	Special studies: observations (third-party, mystery clients)	Different quality of care (QoC) indices can be derived depending on type of service (e.g., antenatal care vs. family planning vs. delivery vs. immunization) and tasks allowed (e.g., counseling vs. administration/ diagnosis and treatment); Can be used to construct indicator of proportion of health workers providing

[9] For an illustrative view of the way the indicator may be constructed, see Appendix B, pages 32-33.
[10] For an example of a quality of care index based on observations and a checklist, see Appendix B, pages 21-23.

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
					QoC services
vi. Recognition and Promotion					
29.	Career development and promotion mechanisms	Extent to which country has defined career pathways and promotion mechanisms (with clear guidelines) across health workforce by cadre, service level, and geographical area	Ordinal scale (1-10), based on available positions and merit; gender and family sensitivity; addressing of geographic imbalances; accessibility of information to health workers	Structured interviews at government/Ministry of Health level; documentation review	From HRH Effort Index
30.	% of internally-filled managerial positions	% of middle-high management positions that are filled by current health workers (as opposed to external recruitment)	Numerator: No. of positions filled by current health workers (by cadre, location) Denominator: total no. of positions filled in a given time	HRIS, documentation review, special studies	Illustrative. Can be difficult to ascertain. Certain high-level positions may need external/especially qualified applicants, which may need to be taken off list. Monitoring over time will give an idea of progress and trends
vii. Transition					
31.	Transition of workforce within the country	Proportion of "position losses" due to health worker transition within the country, between occupations, areas or regions; sectors (public/private); institutions; and availability (full-time equivalent/part-time equivalent or vice versa)	Numerator: No. of losses due to internal transition (by reasons) Denominator: losses from internal transition plus other exits (minus deaths and retirement)	HRIS, documentation review, special studies	Adapted from WHO M&E HRH Handbook. Interpretation of this indicator may be tricky. "Losses" of a position for promotion purposes affects an institution less than does leaving to work in another sector (which might not be a loss for country at large); leaving rural areas to migrate into urban ones may impact more than transitions within a location

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
5. Health Workforce Performance Support and Enabling Environment					
i. Job Descriptions					
32.	% of health workers with job descriptions	% of health workers with job descriptions or written performance expectations for their current positions	Numerator: No. of health workers with detailed job description for current position Denominator: Total no. of health workers interviewed x 100	HRIS, facility assessments/surveys	Adapted from DHS Service Provision Assessment (SPA) surveys
ii. Tools and Guidelines					
33.	% of health workers with human resources (HR) manuals available	% of health workers with access to manuals that cover a wide range of staffing norms, including work ethics, leave and rest, safety, career development, workplace violence and gender discrimination, grievance processes, and terms of service	Numerator: No. of health workers with access to detailed HR manual for current job Denominator: Total no. of health workers interviewed x 100	HRIS, facility assessments/surveys	Illustrative. Adapted from DHS Service Provision Assessment (SPA) surveys
34.	% of health workers with clinical/service manuals, guidelines, and/or protocols available	% of health workers with access to updated manuals, guidelines, and protocols that orient and guide their current clinical/service functions, and are based on accepted (e.g., WHO) best practices	Numerator: No. of health workers with ready access to clinical/service manuals, guidelines, or protocols for current job Denominator: Total no. of health workers interviewed x 100	HRIS, facility assessments/surveys	Illustrative. Adapted from DHS Service Provision Assessment (SPA) surveys
iii. Supportive Supervision and Feedback					
35.	% of health workers who have received supportive supervision in last six months	% of health workers who have been supervised in last six months where supervisor has provided supportive supervision Definition: Supportive supervision index considers whether the supervisor addressed worker physical, information, and development needs; assessed performance to standards/job description, and managed performance problems; updated knowledge and skills	Numerator: No. of health workers who received at least one supportive supervision visit in last six months Denominator: Total no. of health workers interviewed/ assessed x 100	HRIS, facility assessments/surveys	Adapted from DHS Service Provision Assessment (SPA) surveys

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
		as needed; provided constructive feedback			
iv. Compensation/Remuneration/Incentives					
36.	% of workers who have received any form of incentive from employer	% of workers who have been recognized for their work (e.g., employee of the month), or have received incentives, e.g., training, goods, allowances, time off, or other forms	Numerator: No. of workers who have worked in the institution for at least five years and who have received any form of recognition or incentive Denominator: Total no. of health workers who have worked in the institution for at least five years, by position, cadre, and facility/workplace x 100	HRIS, facility assessments/surveys	Illustrative. Adapted from DHS Service Provision Assessment (SPA) surveys
v. Communication and Connectivity					
37.	Communication by employer	% of health workers who receive at least semiannual communications from employer, such as management meetings, staff meetings, or newsletters, to share staff-important information such as policies and trends, training opportunities, recognitions, and technical content	Numerator: No. of health workers who received forms of communication at least semiannually Denominator: Total no. of health workers by position, cadre, and facility/workplace x 100	HRIS, facility assessments/surveys	Illustrative
38.	Connectivity	% of health workers who are able to access Internet or cellular networks paid for or supported by employer	Numerator: No. of health workers with connectivity Denominator: Total no. of health workers by position, cadre, and facility/workplace x 100	HRIS, facility assessments/surveys	Illustrative
vi. In-Service Training					
39.	In-service training	% of health workers who have received in-service training (all forms) based on performance assessments, task analysis, or development needs at least once every 3-5 years, by cadre, location, and type of training	Numerator: No. of health workers receiving in-service training Denominator: Total no. of health workers by position, cadre, and facility/workplace x 100	HRIS, documentation review, facility assessments	Adapted from DHS Service Provision Assessment (SPA) surveys

No.	Indicator	Definition	Method of Calculation	Data Source and Collection Method	References & Notes
vii. Safety					
40.	Facility-based occupational safety and health	% of facilities that comply with occupational safety and health policy	Composite indicator (index) made of findings in facility: description of occupational safety and health in workers' contracts; emergency exits and signs; safety boxes; protocols for universal precautions and post-exposure prophylaxis enforced; safety mechanisms to/from facility	Facility assessments/surveys	Illustrative
6. Monitoring and Evaluation of Human Resources for Health					
41.	M&E capacity	Extent to which there is an M&E officer/office that tracks key HRH indicators; has personal capability, physical equipment, and supplies for the job; and has sufficient funding. This job should be part of national HRH plan (can be shared with HRIS); data are used for policy-making	Composite indicator (scale 1-10) based on personal and physical capacities, funding, integration with HRH plan and use of data	Structured interviews at government/Ministry of Health level; documentation review	Adapted from HRH Effort Index

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APPENDIX A: ADDITIONAL RESOURCES

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APPENDIX B: MEASUREMENT TOOLS
ILLUSTRATIVE DESCRIPTIONS AND CONSTRUCTION OF INDICATORS BY TYPE

Ordinal Scales

An ordinal variable is a way to characterize categories of responses, but with a specified *order*: from low to high, from weak to strong, and so on. For example, Likert scales will order the perception of a respondent on a 5-point scale over a certain item/subject, from "Totally Disagree," "Partially Agree," "Neutral," "Partially Agree," to "Totally Agree." They are not as "strong" as interval variables (e.g., number of months working in a facility), where intervals between two numbers (e.g., from 7 to 8, and from 8 to 9) are *equally* spaced. In ordinal scales, even if one assigns numbers from 1 to 5 for the above Likert scale example, there is no certainty that the space between 1 and 2 is the same as between 4 and 5. However, it does allow respondents to express certain degree of "strength" or importance of the topic.[11] A specific example follows.

Indicator 1: Political support for HRH

Question: "What is the extent to which elected officials in the country prioritize meeting HRH needs to strengthen the workforce by passing laws and regulations and sponsoring actions and policies aimed at improving the health workforce? Please circle the score that reflects such extent the closest, from **1** to **10**, **1** being "**Extremely weak/minimal**" and **10** being "**Extremely strong/optimal**."

Extremely weak/minimal									Extremely strong/optimal
1	2	3	4	5	6	(7)	8	9	10

The scale or "rating" selected is 7.

Indices

An "index" is a composite indicator made up of a number of individual elements (or items). An index is typically constructed when one tries to summarize an area or dimension that is either difficult to encompass with only one item, or the topic is complex and needs to be seen from several angles to fully define it. This is the case in social science research, where measurements of aspects such as attitudes and values (e.g., job satisfaction) and status (e.g., capacity of an individual or office) might not be as straightforward and precise as in other areas.

To construct an index, one needs first to *select* items or elements that are logically connected to that which one intends to measure. This is called the *validity* of items. The most important is the *face validity*; that is, that the item selected is obviously closely related to what is intended to be measured (e.g., staff trained as an element of capacity). There are other, more sophisticated and statistical ways to measure additional aspects of

[11] For more discussion on the differences between the two types of variables see for example http://www.ats.ucla.edu/stat/mult_pkg/whatstat/nominal_ordinal_interval.htm.

validity, such as construct and discriminant validity (i.e., to confirm that elements and dimensions are measuring different aspects though complementary to each other) and criterion-related validity (i.e., items and dimensions *are* effectively measuring what they are supposed to measure, or correlate well with other similar indices). Individual items and indices also need to be *reliable* (i.e., providing similar, consistent, and stable results if applied repeatedly to the same individual or by other raters).

The next step in constructing an index is *weighting* each element that contributes to the index. One can test the original index with a number of individuals or facilities and analyze the content of results. There are statistical analyses that are used for this purpose, such as *factor analysis*, which helps determine if some elements may have relatively more of a say within the index than others (based on their coefficients or *loadings*).[12] For these illustrations, it is assumed that each item, though correlated with the dimension (e.g., capacity) is independently and uniquely contributing to the dimension, *with equal weights* (i.e., one is no stronger than the other, just different) in explaining overall capacity. A couple of examples follow.

Indicator 28: Quality of care index

An index of quality of care can be constructed by adding different elements that should have occurred during a consultation.[13] These elements can be summarized as greeting the client; taking an individual and family history of health, lifestyle, and disease (including current status); performing the necessary examinations; providing the counseling and explanations required (e.g., for dosage/use of drugs/methods); and ensuring continuation/follow-up/return depending on circumstances. The observer records which of these steps have occurred during the consultation. An example follows below for a new family planning client wishing to use hormonal contraceptive pills or injections:[14]

INSTRUCTIONS TO THE OBSERVER: **UNDERLINE AND BOLD** ACCORDING TO WHAT WAS OBSERVED; ITEMS DO NOT HAVE TO BE DONE IN SEQUENTIAL ORDER. Please note that DK stands for "Don't Know" and NA stands for "Not Applicable."

NUMBER	ITEM	YES	NO	DK	NA
104 – 01	CLIENT STATUS. (OBSERVER TO COMPLETE): INDICATE WHETHER THE CLIENT HAS HAD ANY PREVIOUS CONTACT WITH A PROVIDER AT THIS FAMILY PLANNING UNIT.	**1**	0	8	5
02	(IF FEMALE) INDICATE WHETHER THE CLIENT HAS EVER BEEN PREGNANT.	**1**	0	8	5
105	CLIENT'S PERSONAL INFORMATION AND REPRODUCTIVE HISTORY. INDICATE BELOW WHETHER THE PROVIDER ASKED ABOUT OR THE CLIENT VOLUNTEERED INFORMATION ON THE FOLLOWING ITEMS:				
01	Age of client	**1**	0	8	5
02	Number of living children	**1**	0	8	5
03	Last delivery date or age of youngest child	**1**	0	8	5

[12] For more discussion of index construction, see for example http://sociology.about.com/od/Research-Tools/a/index.--ZB.htm.

[13] Here the method of laying out the key elements that should be present in the consultation has been adopted. The observer checks whether the step was done or not. There is an inherent assumption that if the procedure was done (e.g., taking blood pressure), it was done *well*. Other methods can look into *how well* the procedure was done, clearly requiring a different level of observer (i.e., an expert) and more training to standardize recording of observations. For a tool that attempts to measure the quality of care in family planning, see http://www.cpc.unc.edu/measure/publications/ms-01-02.

[14] Adapted from the Service Provision Assessments family planning observation protocol, http://www.dhsprogram.com/publications/publication-SPAQ2-SPA-Questionnaires.cfm.

NUMBER	ITEM	YES	NO	DK	NA
04	History of complications with pregnancy	**1**	0	8	5
05	Last menstrual period (assess if currently pregnant)	**1**	0	8	5
06	Desire for a child or more children	1	**0**	8	5
07	Desired timing for birth of next child	1	**0**	8	5
08	Breastfeeding status	**1**	0	8	5
09	Regularity of menstrual cycle	1	**0**	8	5
106	RECORD WHETHER THE PROVIDER PERFORMED ANY OF THE FOLLOWING PHYSICAL EXAMINATIONS OR ASKED ANY OF THE FOLLOWING HEALTH QUESTIONS.				
01	Took the client's blood pressure	**1**	0	8	5
02	Weighed the client	**1**	0	8	5
03	Asked the client about smoking	1	**0**	8	5
04	Asked the client about symptoms of STIs (e.g., abnormal discharge)	1	**0**	8	5
05	Asked the client about chronic illnesses (heart disease, diabetes, hypertension, liver or jaundice problem, breast cancer)	**1**	0	8	5
06	Looked at the client's health card (either before beginning the consultation or while collecting information or examining the client)	**1**	0	8	5
107	RECORD WHETHER THE PROVIDER TOOK ANY OF THE FOLLOWING STEPS TO ASSURE THE CLIENT OF PRIVACY.				
01	Ensured visual privacy	**1**	0	8	5
02	Ensured auditory privacy	1	**0**	8	5
03	Assured the client orally of confidentiality	1	**0**	8	5
04	Asked the client about questions or concerns regarding methods currently used	**1**	0	8	5
05	DID THE CLIENT SAY SHE HAD ANY CONCERNS OR ASK ANY QUESTIONS ABOUT SIDE EFFECTS OR ABOUT THE METHOD?	**1**	0	8	5
108	RECORD WHETHER THE PROVIDER DISCUSSED ANY OF THESE ISSUES RELATED TO SEXUAL PARTNERS AND CHOICE OF FAMILY PLANNING METHOD.				
01	Partner's attitude toward family planning	1	**0**	8	5
02	Partner status (number of sexual partners for client or for client's partner; partner's absence)	**1**	0	8	5
03	Risk of STIs/HIV	1	**0**	8	5
04	Use of condoms to prevent STIs/HIV	1	**0**	8	5
05	Using condoms along with another method (dual method) to prevent pregnancy and STIs/HIV	**1**	0	8	5
109	FOR HORMONAL CONTRACEPTION (PILLS OR INJECTABLES), INDICATE WHETHER THE RELEVANT INFORMATION WAS ASSESSED/DISCUSSED				
01	When to take (pill daily; injection either every month or every 2 months or every 3 months)	**1**	0	8	5
02	Changes that may occur with menstruation (decreased flow or amenorrhea, spotting)	**1**	0	8	5
03	Initial side effects that may occur (such as nausea, weight gain, and breast tenderness)	**1**	0	8	5
04	What to do if forget pill or do not get injection on time	**1**	0	8	5
05	Method does not protect against STI	1	**0**	8	5
06	Should return to clinic if side effects continue	**1**	0	8	5

The observation protocol was answered for the following sections, questions, and items:

SECTION AND QUESTIONS		ITEMS	ITEMS OBSERVED
I.	Client status and previous contact - Q. 104 (01 and 02)	2	2
II.	Client personal information and reproductive history - Q. 105, 01-09)	9	6
III.	Physical examination/health questions - Q. 106 (01-06)	6	4
IV.	Privacy assurance - Q. 107 (01-05)	5	3
V.	Sexual partners and choice of method - Q. 108 (01-05)	5	2
VI.	Information on specific method selected (hormonal contraception) - Q. 109 (01-06)	6	5
TOTAL NUMBER OF ITEMS AND SCORES		**33**	**22 (66.7%)**

According to observation, the provider fulfilled two-thirds (**66.7%**) of tasks as expected. Here, assessors have different options: they can draw a *target* for which all providers should aim (e.g., a minimum of 80% of tasks fulfilled). Also, they could assign a "must-do" characteristic to some items (e.g., assess if currently pregnant) without which *all* percentages drop to zero), or could *weight* different items, if they feel some are more valuable than others. As said, for this exercise, all items are considered to have equal weight.

Indicator 41: Monitoring and Evaluation capacity

The index will be constructed by scoring each of six elements of the personnel and the HRH office, based on interviews and actual observations. The Likert scale is based on a score of 1 to 4 only, 1 being very weak and 4 being very strong.

No.	DESCRIPTION	SCORE (1 = Very Weak, 2 = Weak, 3 = Strong, 4 = Very Strong)
1.	Whether there is an officer who has been appointed to lead the M&E office, and has expertise and/or received training in M&E (including of HRH)	3
2.	The size, location (e.g., prominent vs. obscure), comfort, and state (e.g., cleanliness, decoration, furniture) of the M&E office	3
3.	The number, age, and functionality of computers/laptops and connectivity; guidelines and manuals, supplies and materials to do the job	2
4.	Sufficiency of budget allocation to enforce staff procedures (e.g., assessments, analyses, communication)	2
5.	The number of staff and their qualification, team composition, and distribution of tasks for M&E activities	3
6.	The authority of the office (officer and staff), supported by senior managers in planning and conducting assessments and studies, using data efficiently, and its reporting reaching high levels of management for evidence-based decision-making	2

No.	DESCRIPTION	SCORE (1 = Very Weak, 2 = Weak, 3 = Strong, 4 = Very Strong)
	TOTAL	15
	AVERAGE CAPACITY	**15/6 = 2.5**
	SUMMARY DESCRIPTION: The M&E office has an appropriate number of staff including the manager/officer, with good qualifications, and a comfortable office with minimum requirements. However, their budget is insufficient to run all the required procedures, including having robust computers to do their jobs; they still lack presence among professionals and with senior management to be effectively supported and the results of their work put to good use. Given that the potential maximum potential score is 24, a score of 15 demonstrates that there is room for improvement. The average capacity is **2.5/4** or **62.5%** of the potential total score.	

Ratios and Rates

A *ratio* is a relative expression, a relationship between two different numbers. However, these two numbers are usually related. For example, the health workforce density ratio is the number of health workers (by cadre or category) divided by the population in the same area (usually multiplied by 10,000; see **Indicator 18**). For example, if the number of doctors, nurses, and midwives is 453 for a population of 278,000, then the density of this skilled workforce is:

453 / 278,000 x 10,000 = 16.3

(clearly below WHO's threshold of a density of 22.8/10,000 population for minimum coverage of services).

Also, the *ratio* of female vs. male managers in a region might be a useful measure to detect inequalities in promotion. A *rate* is a special case of ratio, where the two numbers are not related. For example, if the payroll office disburses $30,000 in one year to pay the salary of a nurse, then she is paid $7,500 every quarter (three months). If you want to know the monthly salary *rate* of the nurse, it is $30,000/12 = $2,500. This is also called a *unit rate* (where the numerator is divided by the denominator and everything is related to *one* unit).

In public health and social science, rates often have a special connotation, where the numerator is a subset of the denominator (e.g., rate of female employment over total employment, or the infant mortality rate of deaths of children before their first birthday over the total number of live births in the year, multiplied by 1,000). These rates become fractions and are usually converted to *percentages* (i.e., multiplied by 100) for ease of comparisons between calculation of different sizes. Or they can be multiplied by other factors in order to avoid fractions and produce whole numbers (e.g., 380 infant deaths in one year / 4,600 live births in that year = 0.0826 infant deaths/live births, or 82.6 per thousand live births, which is the infant mortality rate or IMR; in that same district, 42 maternal deaths / 4,600 live births in that year = 0.00913 maternal deaths/live births, or 913 per hundred thousand live births, a clearly high maternal mortality ratio compared to the IMR). Two examples follow.

Indicator 5: Salary ratios of human resources for health salaries compared to other sectors

One reason for high vacancy rates, low retention, and exodus of health workers (from public sector or from the country) is low compensation policies. An investigation of salary levels and ratios of employees within and between sectors, as well as regional comparisons, can shed some light on these problems. Consider the following table with average salary levels across different worker characteristics and sectors, and a neighboring country comparison.

Average Monthly Salary for Public Sector Health Workers (Ministry of Health) and Comparisons by Area, Sector, Gender, and a Neighboring Country (All Salaries in US$, Rounded)

CADRE	URBAN	RURAL	TOTAL	SEX		PRIVATE /NGO/FBO	NEIGHBORING COUNTRY	MINISTRY OF MINING & NATURAL RESOURCES	
				Male	Female		Public sector Ministry of Health	Corresponding cadre	Salary
Doctors	1,270	920	**1,170**	1,350	1,020	1,950	1,450	Engineers (postgraduate)	1,070
Nurses	720	630	**690**	705	685	830	820	Engineers (bachelor)	860
Midwives	640	520	**590**	--	590	780	760		
Pharmacists	840	790	**830**	850	810	1,000	910	Chemical analysts	980
Lab technicians	480	300	**450**	460	320	600	730	Soil technicians	420
Community health workers – paid	150	160	**155**	170	110	--	420	Field surveyors	150

In the table above, what are the major differences in the country between the cadres in the public sector? Between urban and rural? Between male and female? Between the public and private sector? Between the Ministry of Health and similar occupational categories at the Ministry of Mining and Natural Resources? What are the main differences between salaries in our selected country and the neighboring country, for the same types of cadres?

From the table one can derive ratios of salary levels between different categories. For example, within the public sector Ministry of Health it is clear that doctors earn much more than nurses (1170/690 = 1.7 or 70% more) and midwives (1170/590 = 1.98 or nearly twice as much). Even pharmacists are paid more than nurses and midwives (1.2 and 1.4, respectively). Community health workers (CHWs) are paid a meagre third of what lab technicians are paid. All salaries favor the urban area except in the case of CHWs (those in rural areas are paid only 1.07 or 7% more than in urban areas). Other inequalities are seen, for example, with the sex of the worker, where in all cases males earn more than females (1.32 for doctors to 1.55 among CHWs). The private sector pays more in all categories of workers, largely favoring doctors (67% more) than any other cadre

(only between 20% and 33% more). When comparing with another public sector ministry such as the Ministry of Mining and Natural Resources, there is more variation. A postgraduate engineer (equivalent to a doctor) still earns less than a doctor (ratio of 0.91). However, other professionals such as bachelor's-level engineers and chemical analysts make more than their corresponding counterparts at the Ministry of Health. By contrast, their soil technicians earn slightly less than a lab technician (ratio of 0.93), and their field surveyors take home almost as much as a paid CHW (0.97). Finally, when compared with another public sector health ministry in a neighboring country, all categories of workers are paid more (though only 10% more among pharmacists), and their CHWs are paid almost as much as a lab technician in our selected country (possibly reflecting a high priority in their primary health care approach). See what other patterns and differences you can find from the table.

Indicator 9: Number and percentage of foreign health workers by cadre in low-income countries versus high-income countries

COUNTRY	NO. OF FOREIGN NATIONALS			TOTAL NO. OF HEALTH WORKERS			COMMENTS
	Physicians, nurses, and midwives	Auxiliaries	Total	Physicians, nurses, and midwives	Auxiliaries	Total	
LOW-INCOME COUNTRY	300	100	400	800	9,000	9,800	The proportion of skilled health professionals in the country (800/9800 x 100) is very low (8%). The total proportion of foreign health workers in the country (400/9800 x 100) is a modest 4%. However, when analyzed by cadre, skilled health professionals among all foreign health workers (300/400 x 100) are an overwhelming 75%, which is also a sizable proportion of all skilled health professionals for the whole country (300/800 x 100) at ~38%. By contrast, foreign auxiliaries are a meagre 1% (100/9000 x 100) among all auxiliaries, and a similar percentage of all health workers.
HIGH-INCOME COUNTRY	800	23,000	23,800	30,000	90,000	120,000	The proportion of skilled health professionals in the country (30,000/120,000 x 100) is 25%. The total proportion of foreign workers is an important 24%. However, when analyzed by cadre, less than 3% (800/30,000 x 100) are foreign physicians, nurses, and midwives. In contrast, nearly 97% of all foreign workers are from the auxiliary category (23,000/23,800 x 100), which confirms their sizable proportion (25%) of all auxiliaries in the country (23,000/90,000 x 100).

Indicators 13 and 14: Stock and density of human resources for health, and distribution of the health workforce

These are typical indicators that can be obtained through a national human resources information system (HRIS) plus the national census. Through them, the analyst will use several numbers of the distribution of health workers by various characteristics over the total number of health workers, as well as population figures. These are key indicators for planning purposes, and render themselves well for informed decision-making (e.g., redressing unequal distributions). Consider the following numbers:

- **COUNTRY POPULATION:** 46,205,398
- **URBAN POPULATION:** 19,868,321
- **RURAL POPULATION:** 26,337,077

CADRE	No. URBAN	No. RURAL	PUBLIC	PRIVATE/NGO/FBO	AGE GROUP		TOTAL
					<45	45+	
Doctors	6,996	1,235	5,103	3,128	3,457	4,774	8,231
Nurses	37,005	15,115	42,738	9,382	27,624	24,496	52,120
Midwives	6,533	6,276	9,735	3,074	2,946	9,863	12,809
Pharmacists	5,036	1,421	4,455	2,002	3,745	2,712	6,457
Lab technicians	4,233	632	2,627	2,238	2,968	1,897	4,865
Community health workers	28,680	150,570	163,118	16,133	127,268	51,983	179,250
Total	**88,483**	**175,249**	**227,776**	**35,956**	**168,007**	**95,725**	**263,732**

With this matrix, the analyst can do countless analyses of distributions of the health workforce in the country, by cadre, urban/rural, public/private, and age group. One can also find if distributions fit minimum WHO standards, such as the minimum density of skilled health professionals (doctors, nurses, and midwives) per 10,000 population, which is 22.8 per 10,000.[15]

Try to carry out a few analyses from the table above. Once done, see the following expanded table and compare with your results:

[15] See, for example, A Universal Truth: No Health without a Workforce, http://www.who.int/workforcealliance/knowledge/resources/hrhreport2013/en/.

CADRE	No. URBAN	% of TOTAL	No. RURAL	DENSITY (per 10,000 rural pop.)	PUBLIC	%	PRIVATE/NGO/FBO	AGE GROUP		%	TOTAL	%
								<45	45+			
Doctors	6,996	85%	1,235	0.47	5,103	62%	3,128	3,457	4,774	58%	8,231	3%
Nurses	37,005	71%	15,115	5.74	42,738	82%	9,382	27,624	24,496	47%	52,120	20%
Midwives	6,533	51%	6,276	2.38	9,735	76%	3,074	2,946	9,863	77%	12,809	5%
Pharmacists	5,036	78%	1,421	0.54	4,455	69%	2,002	3,745	2,712	42%	6,457	2%
Lab technicians	4,233	87%	632	0.24	2,627	54%	2,238	2,968	1,897	39%	4,865	2%
Community health workers	28,680	16%	150,570	57.17	163,118	91%	16,133	127,268	51,983	29%	179,250	68%
Total	**88,483**	**34%**	**175,249**	**66.54**	**227,776**	**86%**	**35,956**	**168,007**	**95,725**	**36%**	**263,732**	**100%**

From this table, a number of things become clear:

- **Urban/rural distribution:** There is a very small percentage of health workers that are doctors, pharmacists, and lab technicians, and they are mostly concentrated in urban areas (78%-87%); conversely, the vast majority of CHWs are concentrated in rural areas (84%), which is vastly disproportionate to the overall rural population distribution in the country (57%).
- **Public/private distribution:** Most of the health workers are employed by the public sector, though when analyzed separately, there's a relatively lower proportion of lab technicians (54%) and a much higher (as expected) proportion of CHWs (91%) in the public sector.
- **Age group distribution:** In the two age groups, one can see that a large majority of midwives are in the 45+ group, which might need to be addressed in the near future (e.g., create and deploy new cadres of midwives) if they are to be replaced from retirement or expanded by policy; conversely, most CHWs are relatively young (probably due to a recent government training of extension workers).
- **Density:** The country as a whole has a density of skilled health professionals of 15.8, falling below the WHO minimum recommendation of 22.8. However, if this analysis is split between urban and rural distribution, one will find that there are 25.43 skilled health professionals per 10,000 population (i.e., larger than the minimum threshold) in urban areas, compared to a much smaller 8.59/10,000 in rural areas. Clearly, this means a major redistribution of health professionals to rural areas is needed in the country.

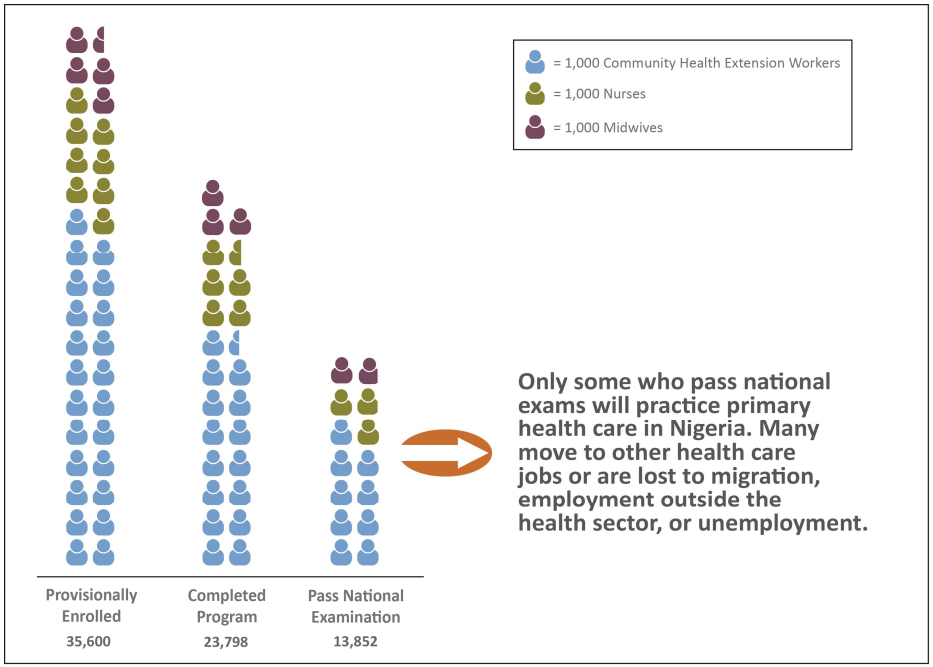
More analyses can be extracted from an information system, such as gender, licensing status of worker, years working in the sector, and so on.

Indicator 19: School attrition (dropout) rate

One key indicator the preservice education area has at its disposal is the school attrition rate (SAR). It measures the number and percentage of students who drop out of the school at a certain period, in comparison to the number who registered or started the

academic program. See for example the figure below coming from Nigeria, depicting students who enrolled in accredited programs from a variety of schools, and those who completed the program (graduated), plus those who passed the national examination, which grants them certification to work in the health sector.[16] It can be seen that of 35,600 students who enrolled, only 23,798 completed the program (67%); however, those who actually passed the national examination (13,852) constitute a smaller fraction of those enrolled (39%). This means there is a high attrition rate, which can have several negative effects, from inefficiencies in school's management and loss of income, aggravation of the human resources for health crisis (insufficient number of workers eligible to enter the workforce), to individuals' frustration and persistence of low education status for the community.

Enrollment, Completion, and Certification of Health Workers in Nigeria (Based on 2009 Federal Ministry of Health and National Exam Reports)[17]



[16] This is the mirror image of attrition rates, the percentage of those who are able to complete studies and register, and is as useful an indicator for planning.
[17] Source: Nigeria's Primary Health Care Training Institutions: Challenges and Progress, http://www.capacityplus.org/files/resources/nigerias-primary-health-care-training-institutions-challenges-and-progress.pdf

This rate can be broken down by characteristics, as needed. For example, imagine that the numbers above were disaggregated into the following table.[18] See if you can spot the most important differences within the table. This is done by deriving percentages within groups and for the totals as well.

Total Number of Students Enrolled for Three Programs (Community Health Extension Workers, Nurses, and Midwives) and Whether They Passed, by School, Gender, and Family Size

Program	Total	School A		School B		Male		Female		Family Size <5		Family Size 5+		Total Passed
	Enrolled	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	Enrolled	Passed	N
Community Health Extension Workers	23,000	12,000	6,240	11,000	2,760	10,000	4,900	13,000	4,100	9,000	5,400	14,000	3,600	9,000
Nurses	8,000	5,000	2,400	3,000	652	-	-	8,000	3,052	3,000	2,010	5,000	1,042	3,052
Midwives	4,600	3,000	1,410	1,600	390	-	-	4,600	1,800	2,000	1,240	2,600	560	1,800
Total	**35,600**	**20,000**	**10,050**	**15,600**	**3,802**	**10,000**	**4,900**	**25,600**	**8,952**	**14,000**	**8,650**	**21,600**	**5,202**	**13,852**

The table allows for a first look at numbers and relative distributions. One can see that there are no male nurses and midwives enrolled, which might be an important point to take up, especially if leaders want to redress the balance for these cadres. The table also confirms the supremacy in numbers of community health extension workers over nurses and midwives. However, in order to extract more information for decision-making, one needs to draw percentages of individuals passing over enrolled for each of the cadres and three characteristics. Try to use the table above to derive a few percentages to be able to compare and better analyze the figures. This can be seen in the table below.

Cadre	Total	School A			School B			Male			Female			Family Size <5			Family Size 5+			Total	
	Enrolled	Enrolled	Passed		Enrolled	Passed		Enrolled	Passed		Enrolled	Passed		Enrolled	Passed		Enrolled	Passed		Passed	
			N	%		N	%		N	%		N	%		N	%		N	%	N	%
Community Health Extension Workers	23,000	12,000	6,240	52.0	11,000	2,760	25.1	10,000	4,900	49.0	13,000	4,100	31.5	9,000	5,400	60.0	14,000	3,600	25.7	9,000	39.1
Nurses	8,000	5,000	2,400	48.0	3,000	652	21.7	-			8,000	3,052	38.2	3,000	2,010	67.0	5,000	1,042	20.8	3,052	38.2
Midwives	4,600	3,000	1,410	47.0	1,600	390	24.4	-			4,600	1,800	39.1	2,000	1,240	62.0	2,600	560	21.5	1,800	39.1
Total	**35,600**	**20,000**	**10,050**	**50.3**	**15,600**	**3,802**	**24.4**	**10,000**	**4,900**	**49.0**	**25,600**	**8,952**	**35.0**	**14,000**	**8,650**	**61.8**	**21,600**	**5,202**	**24.1**	**13,852**	**38.9**

[18] The table depicts *imaginary* data, so should only be interpreted as such.

With the addition of the percentages, it is now possible to analyze further for specific characteristics:

- **Schools:** It is clear that School A not only has more people enrolled per cadre, but also their passing rates are higher than School B, although both rates could be improved.
- **Gender:** This can only be examined among the community health extension workers. The passing rate of males is definitely higher than that of females, revealing an important inequality that needs to be addressed through changes in study organization and enforcement of anti-discrimination policies.
- **Family size:** This is a proxy indicator for socioeconomic condition (e.g., urban/rural, education, access to public services). The relative percentages reveal huge disparities, with smaller families having passing rates about three times as high as larger families. This finding can also be used by the school management to find ways (e.g., flexible study times, child care facilities, extended tutoring) to support students who come from these backgrounds.

With additional time and resources, analysts can mine these data further to extract more information for improved planning. For example, cross-tabulating these and other variables can show whether students coming from certain areas are more prone to default, or if there are more women among students with larger family sizes, and so on. Follow-up surveys can also inform the specific reasons (e.g., pregnancy) that lead some students to drop out of the program.

Indicator 26: Absenteeism

This indicator is a difficult one to measure, but in some places such as health facilities, it may provide useful information for managers. It collects the percentage of days per week and/or hours per day that an employee is absent from his/her post. This indicator, like others, can be disaggregated by characteristics, such as reason for absence, cadre, facility and facility type, region, etc.

In its most complete version, the methodology to obtain this indicator (plus other measures of productivity) is a time-motion study, where an observer "tags" a person at different points in time during working hours, and ascertains what the person is doing, including being absent from his/her post. The fractions of time observed are categorized into productive and unproductive segments, and each one can be further disaggregated as per need (see table below).

Description of Activity Categories

Type	Category	Type of activity	Description
PRODUCTIVE	Direct patient care	Direct patient care	Direct interactions between a health worker and a patient as well as activities directly related to the care of patients. Includes consultation, examination, procedures, surgery, seeking medicines or lab results, etc.
	Indirect patient care	Record-keeping	Activities related to obtaining, completing, or filing patient records
		Health education	Provision of talks to groups of patients (in waiting area or another location) about preventive or clinical health care
		Cleaning, preparation, maintenance	Activities related to cleaning, preparation, and maintenance of equipment or rooms/buildings of the facility; includes preparing hospital beds and changing sheets
		Outreach service delivery	Provision of health services on an outreach basis (outside the health facility). Based on self-report of health worker or worker's supervisor or colleague
		Outreach education	Provision of health education on an outreach basis (outside the health facility). Based on self-report of health worker or worker's supervisor or colleague
	Administration	Administration or management	Activities related to management and/or administration of the health facility
		Work meeting	A meeting of two or more staff members to discuss issues related to their work
		Training	A planned meeting of two or more staff members and/or external visitors to transfer knowledge
UNPRODUCTIVE	Waiting for patients	Waiting for patients	Time health workers spend waiting for patients without doing any other productive activity
	Breaks	Personal calls, texting, Internet	Making personal phone calls, sending personal text messages, or checking the Internet for non-work-related reasons
		Breaks	Breaks from work for recreation, eating, or refreshments
		Socializing	Contacts with relatives, friends, or colleagues that are not related to clinical/medical work
		Personal hygiene	Activities related to personal hygiene or visiting the bathroom
	Absent	Absent	Health worker is not present at work, whether **excused** (sick or holiday leave) or **unexcused** (no one knows his/her whereabouts)
OTHER	Other (please specify)	Other (please specify)	Activities that do not seem to fit into other categories. Please note and comment on all activities marked in this category for later review with the data collection supervisor
	Observer unavailable	Observer unavailable	Observer was unable to make an observation at this time

Source: adapted from Ruwoldt and Hassett 2007

It is important to stress that absences need to be categorized as **excused** or **unexcused**, since there are valid reasons why a health worker might not be in his/her position (e.g., sickness, vacation, home visiting, approved offsite training). A simple table describing the times observed health workers were absent from their services is presented below.

Absence of Health Workers in a Facility, by Valid and Invalid Absences and Corresponding Absenteeism (Hours per Week during a Four-Week Period)

Column #	(1) Week 1	(2) Week 2	(3) Week 3	(4) Week 4	(5) Total Absence (∑1-4)	(6) Total work hours (40 hrs x 4 wks)	(7) Total Absen-teeism (5/6)	(8) Valid Absence	(9) Invalid Absence (5-8)	(10) Legit work Hours (6-16)	(11) Invalid Absenteeism (9/10)	Explanation
Dr. A	15	15	15	25	70	160	0.44	16	54	144	0.38	Dr. A leaves every day at 2 p.m. (3 hours before closing) for dual practice; in week 4 he had 2 approved leave days (16 hours)
Dr. B	6	6	6	6	24	160	0.15	0	24	160	0.15	Dr. B arrives 2 hours late 3 times a week, after operating in private (dual) practice
Nurse A	5	5	5	5	20	160	0.13	0	20	160	0.13	Nurse A leaves every day one hour earlier because of unsafe conditions (leaves before dark)
Nurse B		32			32	160	0.20	32	0	160	0.00	Nurse B went for a 4-day training course in week 2
Midwife A	8	8	32	8	56	160	0.35	32	24	160	0.00	Midwife A goes to home visits (PNC) for 4 hours every week; in week 3 she went to a 3-day LSS course

From the table it can be seen that health workers have a variety of reasons for being absent from their facilities. The table tracks the working hours (total and "legitimate") and absences, whether valid and invalid. Dr. A has the most "invalid absenteeism" by leaving every day early for dual practice. Nurse A needs to leave early because of safety reasons. Management needs to consider if her absence should be considered "invalid absenteeism." Also note that through home visiting plus a training episode, Midwife A had a total absenteeism similar to Dr. A. If she is the only midwife in the facility and her absence will affect onsite services for clients, management would need to reconsider the home visits (e.g., by using community health workers instead) and carefully selecting the number and length of training events that she will attend.

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