CORE DATA

HUMAN RESOURCES FOR HEALTH

Stocks and Flows - Education - Management

BELIZE

2009

Tracking
Regional Goals
for Human
Resources
for Health

A Shared Commitment

Pan American Health Organization
Regional Office of the World Health Organization

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Washington, DC
March 2010

Area of Health Systems based on Primary Health Care (HSS)
Project of Human Resources for Health (HR)
Pan American Health Organization
Pan American Sanitary Bureau, Regional Office of the
World Health Organization

PAHO HQ Library Catalog-in-Publication

Pan American Health Organization

"Core Data Human Resources for Health: Stocks and Flows – Education – Management. Belize 2009. *Tracking Regional Goals for Human Resources for Health: A Shared Commitment*"

Washington, D.C.: OPS, © 2010

ISBN: 978-92-75-13075-9 (Print)

978-92-75-13182-4 (Electronic)

I. Title

1. REGIONAL HEALTH PLANNING – methods
2. HEALTH OCCUPATIONS – education
3. HEALTH PROGRAMS AND PLANS – organization & administration
4. HEALTH MANPOWER – utilization
5. HUMAN RESOURCES
6. HOSPITALS, UNIVERSITY – statistics & numeral data
7. BELIZE

WA 541.DB38

Design and Layout: Matilde E. Molina

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Acknowledgements

This report was produced with the funding support of the Pan American Health Organization/World Health Organization (PAHO/WHO) in close collaboration with the Belize Ministry of Health and the assistance of the University of Belize. It would not have been possible without the ongoing technical assistance, support and guidance of Dr. Beverley Barnett, Ms. Marilyn Entwistle and Dr. Guillermo Troya from the PAHO/WHO office in Belize, and Dr. Felix Rigoli and Ms. Allison Annette Foster from the PAHO/WHO Office in Washington, D.C.

We would like to offer our sincere thanks to all those individuals who participated in this review. Many individuals within the Ministry of Health completed long and detailed data requests, provided us with advice, additional leads and supplementary information and some participated in personal interviews as well. We are truly appreciative.

In addition, I would also like to personally thank the members of the consulting team in Belize—Dr. Robert Tucker and Dr. Alfonso Ayala, Ministry of Health of Belize and Dr. Roy Young, University of Belize—for their ongoing assistance in completing this project.

Kind regards,

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List of Abbreviations

BHIS	Belize Health Information System
CARICOM	Countries of the Caribbean Community
HRH	Human Resources for Health
KHMH	Karl Heusner Memorial Hospital
MoH	Ministry of Health
MDG	Millennium Development Goals
NHIS	National Health Insurance Scheme
OAS	Organization of American States
PAHO	Pan American Health Organization
PHC	Primary Health Care
SIB	Statistic Institute of Belize
SLA	Health Service Level Agreements
UB	University of Belize
UWI	University of the West Indies
WHO	World Health Organization

Executive Summary

Rationale

The objective of human resources for health (HRH) planning is to equip governments with the information and tools they require to determine the health workforce needed to meet the needs of the population, both now and in the future. With HRH representing the largest portion of the health care budget in most countries, the capacity to estimate changing population health needs and future gaps in HRH supply and demand is critical to achieving an effective and efficient health care delivery system.

Regional Context of Human Resources for Health (HRH) for the Caribbean and Latin America

In 2005, the Toronto Call to Action[1] mobilized the health sector, nationally and internationally, to collectively strengthen HRH to assist the countries in the Region of the Americas in order to achieve the Millennium Development Goals and to provide access to quality health for their populations. In this document, 28 countries of the Americas Region committed political will, resources, and targeted action to confront the five HRH challenges over the next 10 years. In 2007, a Health Agenda for Americas, 2008-2015, was launched by the Ministers of Health of the Americas Region as a shared vision to address the challenges over the next decade to improve the health of the peoples of the Region. To define this vision, twenty Regional goals were adopted by the 27th Pan American Sanitary Conference in July 2007 in Resolution # CSP27/10, “Regional Goals for Human Resources for Health 2007-2015.”

A task force of the Regional Network of Observatories of Human Resources for Health in the Americas[2] established a reference manual or guide which standardized across the region both definitions used in the Resolution and processes for establish-

1. Toronto Call to Action, 2006-2015, Towards a Decade of Human Resources for Health, Regional Meeting of the Observatory of Human Resources in Health, October 4-7, 2005.
2. The Regional Network of Observatories helps promote, develop and sustain the knowledge base for HRH by disseminating information throughout the Region, including evidence to support policy decisions to strengthen health systems and improve health service delivery.

ing the regional goals baseline values and monitoring progress achieved over the decade.

The assessment of individual countries in relation to their starting points (baselines) in reference to each of the goals and their priority focus for addressing those goals most needing attention will inform policy makers in their HRH strategies and contribute to plans of action at the national and the regional levels of the Americas.

National Context of Health Systems and HRH in Belize

The Government of Belize Health Sector Reform Program (2007-2011) emphasized strengthening the organizational and regulatory capacity of the public sector, service rationalization and improving coverage and quality of services, and the establishment of a National Health Insurance Scheme (NHIS). A principal aim of the reform program included a national policy to identify, streamline and better manage HRH. To that end, policies are being considered to (a) improve the distribution of HRH across the country; (b) to manage migration; and (c) to define guidelines for a HRH monitoring and evaluation strategy. The Belize Health Information System (BHIS) integrates health information and provides all citizens with an electronic health record. As part of this program, an HRH module has been developed as a key component of the information system, which will enhance the capacity to better manage HRH and provide up-to-date quantitative data for analysts and decision-makers. In support of the Belize Health Sector Reform Program, a national HRH unit (or technical post) and team, regional HRH planning committees, an HRH information system and an HRH strategic plan were all identified as priorities for action.

Objectives

In light of the above, the main objectives of this HRH project were two-fold. The first was to complete the collection, analysis and report of “the HRH core data set” for Belize, completing a project that was initially launched in 2008. This “core data set” of quantitative and qualitative data that includes stocks and flows, education, and management and regulation, reveals the landscape of HRH of Belize and highlights immediate concerns or issues.

The second objective was to conduct background research required to produce a status report for Belize of its starting point, or “baseline” in relation to the indicators for the twenty HRH goals for the Region of the Americas. The report on this second part of the project—Belize baselines for the 20 goals—can be found in a separate report entitled “*Baseline Indicators - Belize 2009.*”

A research team was established in Belize with support from the Ministry of Health, the University of Belize, and the PAHO/WHO Offices in Belize and Washington, D.C. A

number of meetings were held and advice was sought from a number of senior managers within the Ministry of Health.

Ten data fields from the 2008 Core HRH Data Set Project, which used HRH listings from the Ministry of Health personnel records, were identified as key to the research initiative. Applying this framework, data was collected on all employees in both the public and private sectors over the period June to August, 2009. In addition, detailed information on the graduates from the University of Belize between 2000 and 2009 was also collected and reviewed. Linking the graduate data to the HRH data provided an indication of the general retention and overall distribution of health professional graduates throughout Belize.

While the data fields did impose certain limitations on the kinds of data collected, this one-time data collection exercise did not allow for historical trend analyses. Over time, as the processes for gathering and analyzing this core data are established, it is expected that the activity will be repeated annually or bi-annually (ever improving the processes) and trends will become apparent over time.

Data collected, which is both current and confirmed, provides a range of planning information that was previously unavailable in Belize to support both HRH development and management.

HRH strategies are about ensuring that there are enough health workers with the right skills and in the right places to meet the health care needs of the population. The general aim of HRH research and monitoring is to provide the information and tools needed by decision-makers to make informed choices regarding HRH programs and policies. An enhanced HRH information system supports evidence-based health services planning by identifying emerging trends and issues, estimating future HRH needs and supply gaps and determining priorities for action. In addition, the ability to track and monitor changes over time provides insight into which policies and interventions are most effective and identifies where enhanced public support, fiscal space and stakeholder participation are required.

HRH Overview and Graduate Trends at the University of Belize

In the 1990s, Belize ranked in 40th place out of forty-seven countries of the Region of the Americas in terms of density of HRH. Belize exhibited strong growth over that decade, rising to 29th place by the year 2000, and ranking in 1st place with respect to the seven countries of the Central America Isthmus. By 2005 however, of the thirty countries surveyed, only three had a lower number of physicians per 10,000 popula-

tion than Belize. By contrast, Belize ranked in 2nd place in Central America and in 9th place within the Region of the Americas in terms of the total supply of nurses.

WHO estimates that five countries of the Americas Region and fifty-seven countries world-wide have critical shortages of physicians, nurses and midwives, totaling 38,000 and 2.4 million, respectively, or 4.3 million if all health care provider groups are included.[3] While Belize had a ratio of 25 health care professionals (physicians, nurses and midwives) per 10,000 population in 2005—the minimum acceptable standard identified by WHO—in recent years its HRH density has fallen below this target figure.

With respect to HRH in Belize in 2009, a number of interesting points emerge:

- Since the year 2000, Belize's population has grown at a rate of more than 4% per year, averaging almost 6% in the Cayo and Belize Districts.
- About 52% of the population of Belize lives in rural areas.
- There were 2,283 workers employed in the health system in 2009, 1279 (56%) were health care providers while the remaining 1004 (44%) were administrative and other support staff. About 43% of health care providers were employed in the District of Belize.
- Women are 68% of the health care provider workforce, outnumbering men 2.2 to 1.
- Belize's health care providers are relatively young, 25% being in their 30s. Only 4.5% are over 55 years of age, but within a decade 16% of nurses and 20% of community health workers may be over 55 and nearing retirement age.
- There are about 30 nationalities and ethnic groups in the Belize health care provider workforce, Mestizo and Creole totaling 61%.
- Mestizo and Mayans are not well represented in the health care provider workforce (36% combined) although together they represent 63% of the total population.
- About 38% of health care providers speak only English, 5% speak only Spanish, while 41% speak Spanish and English.
- There are 181 general practitioners and 64 medical specialists working in Belize. The current density of physicians per 10,000 population is 7.5.
- Professional/registered nurses (excluding midwives) with a density of 10.2 per 10,000 population, outnumber doctors by a factor of 1.36 to one, or 1.95 to one if practical nurses are also included.

3. World Health Organization, The World Health Report 2006: Working together for health. Chapter One, Health Workers: A Global Profile, pp. 12-13.

- Between 2005 and 2009, the number of registered nurses remained relatively stable while the number of specialists fell from 159 to 60. The combined ratio of registered nurses and physicians per 10,000 population dropped from 23.3 in 2005 to 17.7 in 2009.
- Only 38% of employment positions are “established,” (permanent or secured positions) within the health workforce, while 23% of the positions are filled by either volunteers or “precarious” workers (meaning workers without secure positions) such as contract, part-time, short-term, or hourly workers.
- Cuban volunteers, representing about 3.4% of the total number of health care providers, are recruited to fill gaps in the delivery of primary health care services.
- Only about 20% of all physicians are employed in established positions.
- About 80% of all health care providers (i.e. clinical workers and health professionals) are employed in the public sector.
- The District of Belize has the greatest density of health care providers relative to its population while the Cayo District has the lowest relative density.
- Urban health care providers out-number rural health workers by a factor of 6.4 to 1. Although 52% of the population of Belize lives in rural areas, only 13.6% of health care providers reside there.
- Only about 51% of graduates from health training programs at the University of Belize between 2003 and 2007 are currently working in the Belize health care system.
- Of those retained, about 80% of graduates returned to the districts in which they resided when they had applied to the University of Belize.
- Overall attrition from employment was relatively low with health care providers having been in their current jobs an average of 9.5 years.

With respect to graduates from the health training programs at the University of Belize:

- Application rates to health training programs at the University of Belize[4] have doubled over the past decade.
- While applicant acceptance rates to health training programs are often over 80%, student registrations are only between 53 and 60%.
- Orange Walk and Corozal Districts and Mestizo and Mayan ethnics groups are not well represented among applicants to health training programs.

4. University of Belize health training programs include: Social Work, Medical Laboratory Technology, Pharmacy, Public Health Inspectors, Professional Nursing, Rural Health Nursing, Public Health Nursing, Midwifery, Psychiatric Nurse Practitioner and Practical Nursing.

- The program completion rate for students in health training programs between 2001 and 2005 was only 34%.
- There were over 7,000 applicants to health training programs at the University of Belize over the past decade but only 528 graduates.
- The number of graduates produced annually from each of the ten health training programs exhibited wide variation between 2000 and 2009. For example, while there were 26 midwifery graduates in 2002, no graduates were produced between 2004 and 2006. Similarly, the number of nursing graduates varied from a low of 5 in 2006 to a high of 26 in 2008.
- Although 52% of the population is rural, only 21% of graduates were from rural areas.
- Of 142 nursing graduates in recent years, 117 elected to take the nursing certification exam. Only about 50% of nurses pass the certification exam in any one year. Nurses wrote the nursing examination an average of 1.62 times before achieving a passing grade, though only about 68% pass the exam overall.
- About 50% of students in health training programs received scholarships with a proportionately higher number of students from Cayo and Stann Creek Districts receiving assistance.
- Belize's ratio of physicians, nurses and midwives[5] per 10,000 population is only 18.8. A total net growth[6] of 32 physicians, nurses and midwives per year is needed to reach a HRH density of 25 per 10,000 by 2015—plus an additional 26 annually to accommodate ongoing population increases—for a grand total requirement of 58 per year.
- The average output from all health training programs at the University of Belize over the past decade has been 53 annually. The output from the nursing and midwifery training programs has averaged less than 14 graduates per year, well below anticipated requirements.

Implications and Next Steps

In light of the above, steps need to be taken at policy and program levels to:

- increase student enrollments in health training programs at the University of Belize;

5. Two-thirds of midwives in Belize are also trained nurses. For purposes of this inventory, health care providers are only listed once in relation to their role in their current clinical positions, irrespective of other credentials they may possess, in order to avoid double-counting.
6. In view of their wide range in roles and differences in deployment globally, WHO only provides a HRH density target for physicians, nurses and midwives as a team, not on an individual professional basis.

- increase the uptake of applicants who have been accepted into health training programs;
- recruit more students from rural areas and ethnic populations;
- expand the number and range of scholarships across health training programs and districts;
- reduce student attrition from health training programs;
- enhance graduate retention rates;
- improve graduate certification exam pass rates;
- significantly augment the number of employment opportunities for health professional graduates; and,
- increase the proportion of 'established' employment positions available to health care providers.

This report makes a broad range of recommendations to support HRH development in terms of partnerships, capacity building, data development, research and strategic planning to address identified HRH concerns.

In specific terms, it is recommended that a permanent national HRH planning advisory committee be established with broad representation from professional, university and government sectors to assist the MoH of Belize on an ongoing basis to develop and implement an HRH strategic plan for the country. This would include providing whatever support is necessary to the MoH HRH Unit to lead and carry out this initiative. The development of an HRH minimum data set to support health services planning that is integrated with the BHIS would be key to these initiatives. The current physician recruitment and retention plan as well as the role and capacity of the University of Belize need to be evaluated.

As a first priority, the data suggests that a HRH strategy will be useful in considering the priorities that have been mandated by the Ministry of Health for the long-term health service needs of the population, the capacities of Belize's health care delivery system and the options available to respond in a way that is viable and sustainable over the longer term.

1. Introduction

1.1. Background and Context

Toronto Call to Action

The Toronto Call to Action for a Decade of Human Resources for Health in the Americas (2006-2015) brought together discussions of the working groups at the Seventh Regional Meeting of the Observatories of Human Resources in Health held in Toronto, Ontario in October, 2005. The Call to Action aimed to mobilize the health sector, nationally and internationally, to collectively strengthen the human resources in health (HRH), through both policies and interventions, in order to achieve the Millennium Development Goals and to provide access to quality health services for all the peoples of the Americas by the year 2015.

The objectives and strategic challenges that were discussed highlighted five areas of shared concern for HRH development of the Region:

1. Polices and long-term plans for the adaptation of the work force to the change in the health systems and to the health conditions of the population.
2. Equitable distribution of health workers.
3. Effective management of the migration of health workers.
4. Mechanisms of interaction between training institutions and health services to adapt to a model of universal, equitable and quality care.
5. Relations between labor and the health authorities so as to establish means of managing conflicts and processes for continuation of essential services despite any labor disputes.

It was agreed that the primary areas of action in facing these challenges should focus on the following:

- Strengthening of leadership in public health.
- Increasing investments in human resources.
- Integrating and coordinating HRH activities in all areas.

- Continuity of policy and intervention.
- Improving systems and processes for gathering and sharing information to facilitate effective decision-making.
- It was also emphasized that education and training should be included in all interventions and activity areas.

Building momentum for future collaborative action, the Toronto Call to Action strongly reinforced the need for making long-term, directed and coordinated efforts to promote, strengthen and develop HRH in all the countries of the Region of the Americas.

Pan American Health Organization/World Health Organization (PAHO/WHO)

A summary of actions and proposals for a plan of action on HRH in the Americas was submitted for consideration to the 47th Directing Council in August, 2006.

The plan of action recognized that the quantity, quality and distribution of HRH must be enhanced to achieve the health goals of the countries of the Americas. In particular, it would be necessary to:

- Define and implement long-term HRH policies based on reliable information linked to overall health policies.
- Put the right people in the right places as part of an effort to correct inequities in the availability of health workers.
- Manage the domestic and external migration of health professionals so that it does not result in shortages that affect the most vulnerable populations.
- Achieve a commitment by health workers to provide quality services to the entire population.
- Work together with universities, schools of public health and health services to ensure that the education of new professionals and technical personnel is adapted to the health needs of the population.

To this end, it was recognized that a planned and sustained effort was needed that would require not only internal work in countries, but also collaboration among countries, sharing experiences and knowledge.

The PAHO/WHO Belize Country Co-operation Strategy 2008-2011 has four strategic priorities including strengthening health sector policies and organization. Within each strategic priority, main foci and areas for action have been identified, as well as the core functions and strategies that the Organization will use to address them. The main foci included under “strengthening health sector policies and organization”

are strengthening the MOH's institutional capacity, national health insurance, health systems management, human resources for health, and technical cooperation among countries.

Health Agenda for the Americas

In June 2007, a Health Agenda for the Americas, 2008-2017, was launched by the health ministers of the Region during the 37th regular session of the General Assembly of the Organization of American States (OAS). The Health Agenda expressed the shared vision of the countries of the Americas for addressing expected trends and challenges over the next decade to improve health among the peoples of the Region.

The Health Agenda specified eight areas of action:

1. Strengthening the national health authority.
2. Tackling health determinants.
3. Increasing social protection and access to quality health services.
4. Diminishing health inequalities among countries and inequities within them.
5. Reducing the risk and burden of disease.
6. Harnessing knowledge, science and technology.
7. Strengthening health security.
8. Strengthening the management and development of health workers.

With respect to the health workers, the Health Agenda reflected the need to collaborate to address the principal challenges of:

- Defining long-term evidence-based policies and plans to develop HRH.
- Resolving inequities in the distribution of health workers.
- Promoting national and international initiatives for countries to retain HRH and avoid deficits.
- Improving personnel management capacity and working conditions.
- Linking training institutions with health services for joint planning to address the needs and profiles of health professionals in the future.

The Agenda incorporates and complements the global agenda included in WHO's Eleventh General Program of Work, adopted by the Member States at the 59th World Health Assembly in May, 2006, and is in alignment with the goals of the Millennium Declaration.

Regional Goals for Human Resources for Health 2007-2015

At the 27th Pan American Sanitary Conference in July 2007, twenty Regional Goals, organized under five principal challenges, which had been developed to address the HRH issues identified above, were presented and ratified in Resolution No. CSP27/10, "Regional Goals for Human Resources for Health 2007-2015." The strategic goals were intended as benchmarks against which to assess the attainment or progress in overcoming each of the five challenges of the Toronto Call to Action. The goals provide an orientation for analysis and formulation of national ten-year HRH plans, according to the specific situation of each country and objectives that are realistic to attain in each context.

Teams of researchers, strategic planners, and policy makers from the HRH Observatory networks in each country determined the baseline values and will monitor the progress achieved over the decade. The identification of Regional goals for the Americas, and an assessment of the status of individual countries in relation to these targets, will contribute to the development of national plans of action and regional strategies for collaborative efforts in the Americas Region and technical cooperation across country borders.

1.2. Health Reform in Belize

Overview

The Ministry of Health is the agency responsible for regulation, financing, health service delivery, sectoral management and the exercise of sanitary authority. The central government exercises supervision and control over the public financing of the health sector. The Belize Social Security Board is responsible for insuring the employed population based on job related injuries and diseases. However there are no public mechanisms at the national level to manage, coordinate and evaluate health services delivery among districts and between the public and private sector (although the Social Security Board shares with the Ministry of Health the costs of phased sites for national health insurance). Defined accreditation procedures/programs for health facilities in Belize do not exist. Private institutions are legally registered as business institutions; there is no legislation at present which addresses the regulation of the private sector health services. In recent years the private sector has been increasing in size and coverage, mostly in the very urbanized areas. There are three private hospitals offering a wide range of secondary and tertiary level services.

At the primary care level, services are provided through health centers and health posts in the rural areas. At the secondary level the health services are provided through community and regional hospitals with services including emergency, surgery, x-ray, laboratory, pharmacy and specialized services. There is one national referral hospital located in Belize City, which provides tertiary level care with some specialized services. The Karl Heusner Memorial Hospital (KHMH), with a capacity of 115 beds,

with three surgical and labor and delivery theatres, is the national referral hospital for Belize.

With respect to certification and professional health practice, the Medical Board of Belize is responsible for the registration of medical practitioners, dentists and opticians. The Nurses and Midwives Council and the Board of Examiners of Chemists and Druggists are responsible for the examination and registration of their respective professions. The School of Nursing under the Faculty of Nursing, Allied Health and Social Work at the University of Belize, participates in a joint accreditation program with other members of CARICOM (countries of the Caribbean community).

Health System Reform

In 2001, the Ministry of Health (MoH) in Belize, funded by the Caribbean Development Bank and the Government of Belize, committed to a series of reforms in the health sector to improve efficiency, equity and quality of health care services and promoting healthier lifestyles.

Health sector reform has resulted in a number of infrastructural and managerial changes in the health care system. One of the major changes implemented was the subdivision of the country into four health regions (Northern, Central, Western and Southern) in 2002. A regional health manager along with a management team is responsible for coordinating the delivery of health services to the communities in their respective geographical areas. The MoH utilizes regional health care action plans to standardize health care service provision among all health care providers in the four health regions. The MoH makes available management models for the different decentralized public health agencies that deliver health services in Belize.

Another major milestone was the introduction of the National Health Insurance Scheme (NHIS) in 2003, designed to provide universal health care to the poorest sector in Belize, namely the Southern Health Region and the southern part of Belize City. In addition, legislative review and new legislation were proposed to provide the legal framework for the health reform project.

During 2001-2004, the MoH also initiated the use of health service level agreements (SLA) in all four health regions for provision of primary, secondary, and tertiary health care services. The goal of these SLAs is to strengthen the optimal provision of health care services for all populations within the framework of access, equity, quality of care, efficiency, patient satisfaction, and harmonizing the health care service delivery in Belize.

The Health Sector Reform Program (2007-2011) consists of three main components:

1. Sector restructuring and strengthening of the organizational and regulatory capacity of the central and regional levels of the public sector, which will strengthen the stewardship and regulatory role of the MoH.

2. Service rationalization and improvement of the coverage and quality of services of public and private sectors by restructuring public facilities, purchasing selective services from the private sector to support the public supply.

3. The roll out of a National Health Insurance Scheme.

A principal aim of the reform program included the identification, streamlining and management of human resources within the health sector. A national HRH policy, based on the broad health needs of the population, remains a priority to be supported by the Belize HRH Observatory and a national HRH information system as an integrated component of the Belize Health Information System. Policy recommendations to improve the distribution of HRH, a national policy on migration, and guidelines for establishment of an HRH monitoring and evaluation plan are being considered.

Belize Health Information System

The Belize Health Information System (BHIS) is a dynamic, comprehensive tool designed to assist the MoH in providing the best health care services in the quickest, most affordable and efficient way to Belizeans. Combining the strengths of the National Health Information System with the Accesstec© Capacity Strengthening Information System, a more effective, confidential and secure system was developed in support of the national health reform process. It is a fully integrated health information system that provides every citizen with an electronic health record. Unique in its scope and comprehensiveness, it connects the MoH with every citizen, hospital, clinic, laboratory and pharmacy across the country. Doctors and nurses are able to quickly and efficiently analyze current data and managers are able to make more informed strategic decisions based on the information readily available from the BHIS.

In 2008, modules of the BHIS were launched in a number of facilities throughout Belize. The initiative includes data modules for both individual client information as well as general health system information. The design captures, stores and organizes client information on admission, discharge and transfer, clinician order entry, identification of high risk pregnancies, laboratory testing and results, finance, and client-based events. It also manages data on pharmaceutical and medical supply chain management and will eventually include system-wide activities such as public and environmental health and communicable diseases.

Part of the health system information will include key data on Belize HRH. The goal of the Human Resources Module is to record the complete set of health sector jobs and job placements to assist human resources departments to administer staff, jobs, performance and discipline reviews, leave requests, qualifications and continuing education credits.

Human Resources for Health

In relation to the Region's Ministers of Health support and adoption of the twenty HRH goals to improve country health workforces, a number of strategic priority areas were identified by the MoH in Belize in 2007:

- A national HRH team and technical post would be created within the MoH.
- Regional HRH planning committees would be promoted and the role and function of the HRH at the MoH would be strengthened.
- The use of HRH information to drive HRH decision-making, planning and policy development would be improved.

In addition the MoH of Belize has prioritized that communications between regions and the MoH will be improved and greater institutional coordination and intersectoral participation and collaboration will be encouraged.

The main activities under an HRH strategic plan will include:

- Development of a situational analysis of the main components of HRH in the country.
- Analysis of HRH trends.
- Implementation of a plan to approach problems or challenges related to HRH that hamper the improvement of the health system.
- Development of a data collection and management process as part of a more timely, sustainable and useful HRH information system.

A MoH HRH Steering Committee was established in 2007 to focus on needs-based planning for HRH and to develop the HRH management capacity at the MOH and facilitate the implementation of the work plan over the next decade.

An HRH review at Belize's regional level suggested that there was a serious shortage of specialists throughout the system. And while staffing sometimes appeared excessive in some technical support categories, by and large HRH were too thinly distributed in rural areas which has hindered effective teamwork among health workers.

A study on attrition indicated that health care workers were leaving their jobs because of working conditions, lack of management communication and support, unconfirmed contracts and pay disparities. A staff retention plan is being considered that would increase data collection on staff opinions, improve communications with management, investigate the low application rate at the University of Belize and accelerate the recruitment process.

2. Objectives and Methodology

2.1. Objectives

The overall objectives of the HRH were:

1. To review the status of current data with respect to the revised HRH core data set project for Belize, to identify information gaps and to assist with its completion.

2. To conduct the background statistical work to enable the development of a status report for Belize in relation to the baseline indicators for the twenty HRH goals adopted by Regional Ministers of Health.

2.2. General Approach

A research team was established in Belize which included Dr. Alfonso Ayala and Dr. Robert Tucker (Belize MoH) and Dr. Roy Young, University of Belize. The team was lead by the Cameron Health Strategies Group, represented by lead investigator Rick Cameron, with the ongoing assistance of the wider staff of the MoH, key informants of the HRH Observatory of Belize, and PAHO/WHO offices in Belize and Washington, DC.

An on-site visit was conducted between June 8 and 12, 2009. An introductory team meeting was held to review current expectations, the scope of the project and the initial planning work that would be undertaken that week. It was clear that the core data set project, which had begun in 2008 and was supposed to support the work of the baseline goals project, had not been completed and the data that had been gathered by the initial project team was not currently available.

As a first step, the data requirements of the revised core data set and each of the goals of the Resolution's 20 goals were reviewed. Using the Regional Handbook for monitoring the 20 Goals, key terms were examined, indicators were explored and clarified, formulae were examined for applicability and definitions and the availability of required data considered. The methodological guidelines of the Handbook were applied and data sources were identified. Sources such as the Belize Medical and Dental Association (BMDA), the Belize Medical Council, the Belize Nursing Council,

the population census, the Gazette, statistical clerks, the MoH Principal Nursing Officer, regional managers of health regions, mobile clinics, administrative officers and the University of Belize members of the team, were all considered relevant to the exercise.

Meetings were held with the MoH administrative officers in regard to both HRH management information and on accessing data on the private sector. Dr. Roy Young presented the available HRH data that had been gathered in the initial core data set project. The data available on graduates from the health training programs at the University of Belize since the year 2000 were also reviewed. Meetings were held with Dr. Ismael Hoare, Dean of the Faculty of Nursing, Allied Health and Social Work at the University of Belize, and issues under challenge five of the Handbook, relating to enhancing cooperation between the University of Belize and health care facilities, were discussed in depth. The PAHO/WHO Office in Belize City was briefed on the results of the meetings.

In follow up, Dr. Robert Tucker held meetings with a number of relevant senior management staff within the MoH to gather additional departmental policy, program and administrative information with respect to Goals 3, 10, 11 as well as Goals 13 to16.

2.3. Regional Data on Health Workers in the Public/Private Sectors

In view of the work that had been previously undertaken in 2008, it was decided that it would be both cost-effective and time-efficient to employ that data gathering instrument to update the health workforce listings from the MoH personnel records.

Twenty-seven data fields had been identified in the HRH core data set collection work initially undertaken by the research in 2008. However, after the available results were carefully reviewed and scrutinized by the team in terms of its completeness, consistency and overall relevance to the baseline data project, it was decided that the data from just ten primary fields from the original survey instrument would be explored more fully. These fields would include the following information for each health care worker surveyed: health region, last name, first name, sex, age, ethnicity, languages spoken, employment post (supported by information on profession and speciality), terms of employment and date of current employment.

While this work was not complete, it was agreed that that the preliminary results could be used to support both core data set development and the baseline goals initiative. The data set (in Excel format) appeared to have the potential to provide a summary overview of Belize's HRH and (with the use of an SPSS© statistical package) would be able to provide a full range of cross-tabulations for the workforce with respect to the information contained in each of ten fields for which data was collected. This promised to have a level of quantitative and qualitative information on Belize's HRH that had been previously unavailable.

While it was recognized that it might be beneficial to explore the additional data fields (employment history, salary, increment date, social insurance number, retirement year, etc.) to support both long-term HRH strategic planning as well as the ongoing personnel management function of the MoH, it was agreed that it was not the top priority for this time-limited consultancy but could perhaps be supported and explored more fully at a later date.

This information, however, did not include the private sector nor the Central District and Belize City and had to be collected separately. Furthermore, information on total hours worked would not be collected at this stage of the data collection initiative.

2.4. University of Belize[1] Graduate Data

In his capacity as Registrar of the University of Belize, Dr. Roy Young provided additional information on graduates from the Nursing and Allied Health programs from the year 2000 up to the most recent graduating class. This included graduates from the following health disciplines: Social Work, Medical Laboratory Technology, Pharmacy, Professional Nursing, Midwifery, Psychiatric Nurse Practitioner and Practical Nursing.

This information on graduates was cross-tabulated on all factors relevant to the project. Linking the core data set and baseline goals initiative would enable us to get a clearer indication of both the general retention and overall distribution of health professional graduates throughout Belize.

A large portion of the work related to this project involved Dr. Robert Tucker contacting the various health authorities in the four health regions of Belize to ensure that HRH data was complete, accurate and up to date. Dr. Roy Young provided assistance in this regard in the North and Southern Health Regions.

The format and content of this report is broad in that it is meant to combine elements of both the core data set and the baseline goals initiative. Additional background material has been provided as context to both facilitate interpretation of the new information being gathered, and to enable the report to be read and understood as a stand-alone document. The chapter on the status of Belize in achieving the Regional baseline goals, however, is intended to be similar to the format employed in the comparable studies conducted in Ecuador and in Trinidad and Tobago. The “visual star” is a common format to provide a visual reference, particularly for macro-level demonstrations and reporting of the results, so countries have a common framework for comparison of the study. This enables country stakeholders and decision makers to easily identify a country’s strengths and weaknesses with respect to reaching its national goals.

1. While there are other universities within the Caribbean region where Belizean students train (e.g. University of the West Indies), the University of Belize is the only university in Belize.

2.5. Caveats and Limitations

While every attempt was made to be as thorough and comprehensive as possible within the time available, a number of caveats and limitations are noted with respect to the information gathered.

- As a preliminary step in developing a minimum data set to facilitate HRH planning, a HRH core data project was begun in Belize in 2008 but not completed. If it had been completed, the core data would have been a considerable asset to the HRH baseline goals initiative. This meant that the first step in this data gathering exercise was to attempt to update the core data project concurrently with carrying out the establishment of the baselines for the 20 HRH Regional goals. It was decided early in the project that rather than starting afresh with respect to data collection, the data collection tool and information fields identified by consultants in the 2008 core data project would be utilized. This was both a strength, in terms of making best use of information previously gathered, and a weakness, in that it tended to focus data gathering solely on completing and updating the data fields from the MoH personnel files that had been central to the Belize 2008 review.

- While the data gathered reflects the current stock of health care providers,[2] and represents an excellent place to begin, there is no comparable data with which to develop historical trends in HRH. It will be important to use this experience as a first step from which to build and strengthen the process of collecting, managing, assessing, and sharing HRH information.

- The mix of primary and secondary data sources is not ideal. It is useful to gain primary data when possible, and over time with improved sources, it will be useful to have consistent data gathering processes and sources.

- The baseline goals initiative includes both qualitative and quantitative goals, some of which present challenges to measure precisely. Indicators that are stated strictly in terms of 'yes' or 'no' responses for example, may undervalue the steps that have been taken and the degree of progress that has been made by the Belize MoH in some HRH management and policy areas.

- While all of the 20 Regional HRH goals have relevance for all countries in the Region of the Americas, specific targets sometimes need to be adapted to the needs of individual countries. For example, while some countries in the Americas have three or four doctors for every nurse, in other countries the reverse trend is true. While Belize has surpassed the Regional target minimum nurse to doctor ratio of one to one, this does not necessarily mean that an appropriate supply of nurses has been achieved or that they are deployed optimally. The appropriateness of a target ratio is a function of the organiza-

2. For purposes of this review, health care providers refers to all those health care workers (professionals, volunteers and other health disciplines) who provide direct patient care, excluding those employed in support positions (drivers, cleaners, etc.) within the health care system.

tion, priorities and capacities of the respective health care delivery systems of individual countries.

It is acknowledged, however, that it is important to have consistent, comparable indicators and monitoring processes to be able to track progress on HRH initiatives over time within Belize and across the Region. The bottom line is that the data collected is current and has been confirmed and provides a range of information that was previously unavailable to support both the personnel function and long-term HRH planning.

3. Human Resources for Health Planning

3.1. Role of HRH Planning

HRH planning aims to ensure that there are enough health workers to meet the health care needs of the population. The general purpose of HRH planning is to provide information and tools needed for decision-makers (governments, health managers, university) to make informed, strategic decisions in recruiting and retaining HRH that are required and making the best use of their skills within a health system that is affordable and sustainable.

Having the right supply, distribution and appropriately deployed health workforce is critical to having an effective and efficient health care delivery system. Policies on recruitment and retention, education and training, licensure, safety and deployment all impact on the availability of HRH and the stability of the workforce. The outcomes of health service delivery depend to a large extent upon the appropriate utilization of health personnel.

Given the overall complexity of the health system, it is important that HRH plans and forecasts be updated and assessed regularly. The fiscal capacity of governments to implement health reform initiatives and to respond effectively to emerging health system priorities and trends is of particular importance given the growing intra and inter-regional competition for limited health human resources.

The management, organization and delivery of health services also contribute to health outcomes by influencing the way work gets done, the amount and quality of care provided, provider health and satisfaction and the costs of service delivery. An efficient mix of human, fiscal and other resources are required to achieve the best outcomes for the population in terms of improved health status, for health care workers in terms of healthier and more stable work environments, and for the health service delivery system in terms of overall effectiveness and efficiency.

Given the global climate of growing fiscal restraint and increasing competition for limited resources, the importance of having effective planning tools to better inform

government decision-making processes is becoming more critical. As such, there is increasing demand for governments to develop and implement evidence-based health services planning and delivery by:

1. Identifying emerging trends and issues.
2. Estimating future gaps between HRH supply and population health service needs.
3. Determining the degree of alignment between the output of the health education system and the long-term requirements of the health care system.
4. Considering the impact and risks of inaction and continuing the status quo.
5. Projecting the probable long-term impacts of new programs, policies, funding mechanisms and management strategies.
6. Determining which kinds of changes to health delivery and HRH deployment will have the greatest impact on health system efficiency and effectiveness.
7. Estimating the impact of social, political and economic factors external to the health care system on its performance and sustainability.
8. Helping to develop appropriate options and contingency plans if existing policies and programs are not achieving their desired results.

Strong linkages between HRH planning and health services delivery are necessary to ensure maximum program coordination and mutual support. A close alignment of government priorities in planning, management and spending is needed to achieve sustainable results.

3.2. Role of HRH Information

Effective HRH planning requires a broad range of information to enable the function to be carried out effectively. This includes information on the goals and functioning of the health care delivery system, including how it is funded and managed as well as how programs and policies are being developed, implemented and evaluated.

Given that health care is a people-based, resource intensive industry, it is also critical to have current, reliable and comprehensive information on HRH in order to determine its scope and capacities to effectively support the changing health care delivery system in meeting the priority needs of the population in a way that is sustainable over the long term.

In more specific terms, the role of data in HRH planning is to:

- Describe current and past trends.

- Identify implications and emerging issues.
- Estimate opportunity costs.
- Determine priorities for action.
- Guide policy and program development.
- Monitor changes and impact of policy initiatives.
- Determine appropriate contingency plans and actions.
- Support system sustainability and accountability.

The development of comprehensive HRH data systems that are integrated with health management information and health care delivery data are fraught with a number of challenges and limitations:

- Infrastructure development and maintenance costs.
- Time-lag in implementation and changing technology.
- Lack of common data standards, definitions, content and format.
- Confidentiality, the lack of unique identifiers and data regulation.
- Current data is often limited, inadequate and incompatible with other data sets.
- New health programs often requiring new data systems to be developed.
- New data lacking historical context to support planning and evaluation.
- No central repository cross-linking human resources for health data to planning, research, evaluation and health outcomes.
- Limited analytical capacity and knowledge transfer between professional groups and across health regions.

In order for HRH data to be an effective planning tool, it must be:

- Valid and consistent over time.
- Reliable and updated.
- As comprehensive as possible.
- Comparable, linked and portable.
- Accessible and translatable.
- Flexible and straight-forward.
- Supportive of evidence-based decision-making.

- Relevant and useful.

In addition to gathering data on health workforce numbers, a number of key indicators are required in order to be able to monitor on an ongoing basis the impact of HRH policies and programs on the overall stability, effectiveness and efficiency of the health workforce.

Indicators that measure and contribute to workforce stability include:

- Workforce growth and geographic distribution.
- Labor turnover, job transfers and chronic (funded) vacancies.
- Absenteeism, attrition and migration.
- Defined career paths and permanent employment positions.
- Labor conflict resolution processes.
- Workforce contribution/participation in decision-making.
- Management skills.

Indicators that measure workforce effectiveness and efficiency include:

- Employment and unemployment rates.
- Workforce participation rates and entrance ratios.
- Staffing mix and ratios.
- Productivity (hours and wages/FTE's).

Development, implementation, maintenance and regular updating of a reliable, accurate, timely and accessible HRH data set is a key priority in the development of a viable HRH plan.

3.3. Belize Health Regions and HRH Planning

The health regions are responsible for personnel management but not HRH planning. As a result, regions tend to lobby for their share of physicians, nurses and other health professional groups based on anticipated vacancies, retirements, or as part of overall program planning. In most cases, HRH planning at all levels is based on real or anticipated vacancies rather than on any long-term population needs-based planning criteria.

With respect to the regions, HRH shortages and distribution problems are felt most in rural areas. When specialists, which are already in short supply, leave areas of high need, service delivery is significantly compromised. Shortages in nursing often

present significant problems in rural areas and in nursing specialty fields. In times of shortages, rural areas are often hit hardest as physicians, nurses and other health workers gravitate to larger urban centers because of greater flexibility in schedules, better facilities and stronger peer group support.

While it may not be possible or appropriate for most regions/districts to engage in their own HRH planning activities at this time, it is recognized that they do represent important partners in ongoing data development initiatives and in national HRH planning processes.

4. Trends in Human Resources for Health

4.1. HRH International[3]

In 1992, 22 countries of the Region of the Americas had HRH ratios (physician, nurses and midwives) below 25 health professionals per 10,000, with Belize ranking in 40th place out of 47 countries. Belize's density of health workers increased by 126% during the 1990s, by far the greatest increase of any of the 22 low human resource density countries mentioned above. By 2000, about one third of the countries of the Americas (15 of 47 countries) still had ratios below 25 health professionals per 10,000 population. While these countries represented 31.9% of the population of the Region of the Americas, they only accounted for 6% of the total stock of doctors and nurses.

In the year 2000, there were approximately 5.2 million physicians and nurses (data on midwives was incomplete) working in the Region of the Americas, averaging 62 health professionals per 10,000 population. Belize, with a comparable ratio of 26.4, ranked 29th with Mexico (and comparable to Jamaica and Brazil) out of the 47 countries surveyed. The range of HRH density ratios was very broad, ranging from 3.6 for Haiti and 136.6 for Cuba. Within the seven countries of the Central America Isthmus, Belize ranked 1st well above the average figure of 15.4 for the Region. The ratio of nurses to physicians (1.56 to 1) was comparable to that of the Region of the Americas as whole (1.94 to 1) and the opposite of the trend in the rest of the Central America Isthmus where physicians outnumbered nurses 2.1 to 1.

Of the economically active population of thirteen countries surveyed within the Region of the Americas in 2000, Belize had the second lowest unemployment rate in the health sector of 1.06%. While women outnumbered men in the health sector by more than two to one, among the unemployed health workers, however, women outnumbered men by three to one.

By 2005, only three of the 30 countries surveyed had lower physician per 10,000 population ratios than Belize. With respect to the supply of nurses however, Belize ranked 2nd highest in the Central American Isthmus region and in 9th place overall.

3. Health Situation in the Americas, Basic Indicators 2005 & 2008, Health Information and Analysis, Pan American Health Organization, Washington, D.C. , 2005/2008.

In 2000, over 163 million people in the Americas resided in areas where the human resource density was below WHO's optimal target level of 25 per 10,000. In the fifteen countries where the health human resource density ratio is below 25, it would take approximately 128,000 additional doctors and nurses to raise the human resource density ratio of these countries to the optimal target level of 25.

In 2006, the WHO estimated that there were 59.2 million people employed in the health workforce world-wide, about two-thirds of which were health service providers. The Region of the Americas has almost one-third of the world's supply of health care workers. Fifty-seven countries were reported as having critical shortages of doctor, nurses and midwives, requiring a 70% increase (2.4 million workers) in the health workforce to meet this demand.

4.2. HRH Historical Supply and Distribution in Belize (2005)[4]

In 2005, an HRH inventory showed that more than one-half of all health personnel continued to be located in Belize City, where there was the largest bed capacity (115) for an estimated population of 87,000. Nationally, there were 159 specialists (MDs), 166 general practitioners (MDs), and 321 nurses. In this 2005 report, the term "registered nurse" is sometimes referred to as a "professional nurse", and does not include practical nurses, nurse auxiliaries or nursing aides. Of the 321 registered nurses, 12 were employed in public health specifically and 52 worked as rural health nurses. It is worthy of note that 34 of the registered nurses were working on a voluntary basis. Of the total number of physicians, 67.7% of the specialists and 46.4% of the general practitioners worked in the private sector. Excluding private and foreign contracted physicians, there were only 34 specialists and 43 general practitioners working permanently within the MoH. The number of dentists in 2005 was 29, a gain of 10 (52.6%) from the year 2000.

In addition, there were 24 public health inspectors, 27 medical technologists, 21 radiographers and 248 community nursing aides. A national network of traditional birth attendants was supported and supervised through the maternal and child health program of the MoH. There was an estimated 70-75 licensed pharmacists, of whom 25 worked in the public health system.

The total number of physician per 10,000 population in Belize in 2005 (including specialists and general practitioners within the public, private and volunteer sectors) was 11.8, while the comparable figure for nursing (public health, registered, and rural health nurses) was 11.5, representing an overall total for Belize of 23.3. The total number of physicians and nurses has experienced mild fluctuations over the past decade, resulting in only shown modest gains between 1995 (20.3), 2000 (24.1) and 2005 (estimated ranges from 23.3 to 26.4).

4. Health in the Americas 2007, Volume II-Countries, Belize, pp. 89-101.

The population growth of Belize was relatively stable between 2.7% and 2.9% annually between 1980s and the year 2000. While the urban-rural population of Belize is roughly split 50:50, for the Region of the Americas as a whole, 79.3% of the population reside in urban areas.

4.3. HRH Shortage (2005)

Belize is experiencing a general shortage of health professionals. Over the last ten years there has been the need to recruit health professionals, especially physicians and nurses from Central America, the Caribbean, and other countries (most notably Cuba), to supplement the delivery of health care.

Belize, with a density of 25 health professionals per 10,000 inhabitants in 2005 had achieved the target proposed by the Ministries of Health of the Americas, from the Toronto Call to Action initiative. It is to be noted that this target identified by WHO is considered the minimum global standard for HRH required in order to meet the basic health care needs of the population.

The majority of health sector workers in Belize are employed in the public sector (approximately 75% in 2005). The largest group comprised practical and registered nurses which represented about two-thirds of the entire workforce. It is estimated that 20% of health personnel work in both the public and private sectors. Updated data are required to identify gaps in the HRH composition and availability in comparison with the national epidemiological and demographic profiles.

In Belize, inadequate HRH is a core weakness of the health system. The problem in the disparity between health care delivery in urban and rural areas is not only reflected in the inequitable distribution of medical equipment and supplies favoring urban areas but also in the number and quality of HRH. This is particularly acute for remote rural areas.

To address the disparity created in the concentration of HRH among health regions, primarily in the urban setting, technical cooperation agreements exist between the Belize, Cuban and Nigerian governments, where HRH (mainly volunteer general practitioners) are deployed to work in the rural areas. About 14% of Belize's health care providers were from these two countries in 2005. It should also be noted that one of the goals of the Decade in HRH development is for countries to become more self-reliant in being able to produce sufficient numbers of HRH health care providers to meet their own needs. Without a medical school, Belize is expected to remain highly dependent upon the recruitment of physicians from abroad for the foreseeable future.

A concentration of HRH exists in the urban areas, especially Belize City in the Central Health Region, where only one-third of the population resides but more than half of health professionals are employed (65% pharmacists, 52% practical nurses, 45% registered nurses and 35% physicians). The Northern Health Region accounts for 32% of

the physicians and 24% of the nurses but about 27% of the population. The Western Health Region has a more equitable distribution of physicians and nurses with respect to its population, but the Southern Health Region has the least number of doctors (8.8%) and nurses (11.6%) while its population represents 18.5% of the country total. The Southern Health Region serves a population that is more dispersed, have access limitations, and live in more precarious socio-economic conditions.

Nursing attrition increased from 7.7% in 2001 to 9.6% in 2006. Several factors contribute to this attrition including inadequate conditions of health facilities, shortage of medical supplies, poor state of buildings, inadequate accident and emergency services, limited availability of drugs, inappropriate ventilation, lack of support and communication from management, unconfirmed contracts, and disparity in pay for doing the same or similar job.

The global shortage in nursing personnel has placed an additional strain on the health delivery system. Over the last decade, developed countries' annual demand for nurses, particularly the U.S., exceed the numbers of nursing graduates from their domestic nursing training programs. As a result, developed countries use attractive financial packages to recruit nurses from developing countries, such as Belize. This practice has created a domino effect as these countries in turn utilize the same practices to recruit from other middle and lower income countries.

Belizean nurses have been emigrating to the United States, Canada and the United Kingdom due to reported local "push" factors: lack of understanding of career paths, supervision problems, unconfirmed contracts, lack of resources, inadequate work environment and personal reasons and issues. In turn, this external migration has added to attrition, contributing to an ongoing shortage of nurses in Belize.

There is a high degree of volatility within the Caribbean region with respect to HRH migration. Of the eight regions of the world, the Caribbean region ranks third highest overall with a physician emigration rate of 8.4%.[5]

5. Mullan, Fitzhugh. Metrics of Physician Brain Drain, New England Journal of Medicine, October 27, 2005, Volume 353 (17): pp. 1810-1818.

5. Belize Human Resources for Health

This section of the report provides a summary of the detailed HRH data contained in Tables 1 to 21 in Appendix B. The data, collected and confirmed between June and August of 2009, is considered current.

5.1. HRH Overview 2009

Population

The Statistical Institute of Belize estimated the population of Belize to be 322,100 in 2008, with approximately 65,200 residents in the City of Belize. With respect to population distribution across districts, Belize (30%) and Cayo (23.9%) had the largest share of the population, with Orange Walk (15%), Corozal (11.4%), Stann Creek (10.3%) and Toledo (9.3%) representing about 46% of the total population.

Between 1980 and 1991, 1991 and 2000 and 2000 and 2008, the population grew 30.3%, 26.8% and 34.1%, respectively. Since the year 2000, the average annual population growth was almost 4.3% for the country as a whole, with Cayo and Belize Districts exhibiting the greatest growth, averaging 5.8% and 5.0% respectively over that period, while Toledo (3.6%) and Corozal (1.6%) population growth rates were significantly lower.

Of Belize's total population of 322,100, about 154,000 (47.8%) resided in the eight main towns, while 168,000 (52.2%) lived in rural areas.

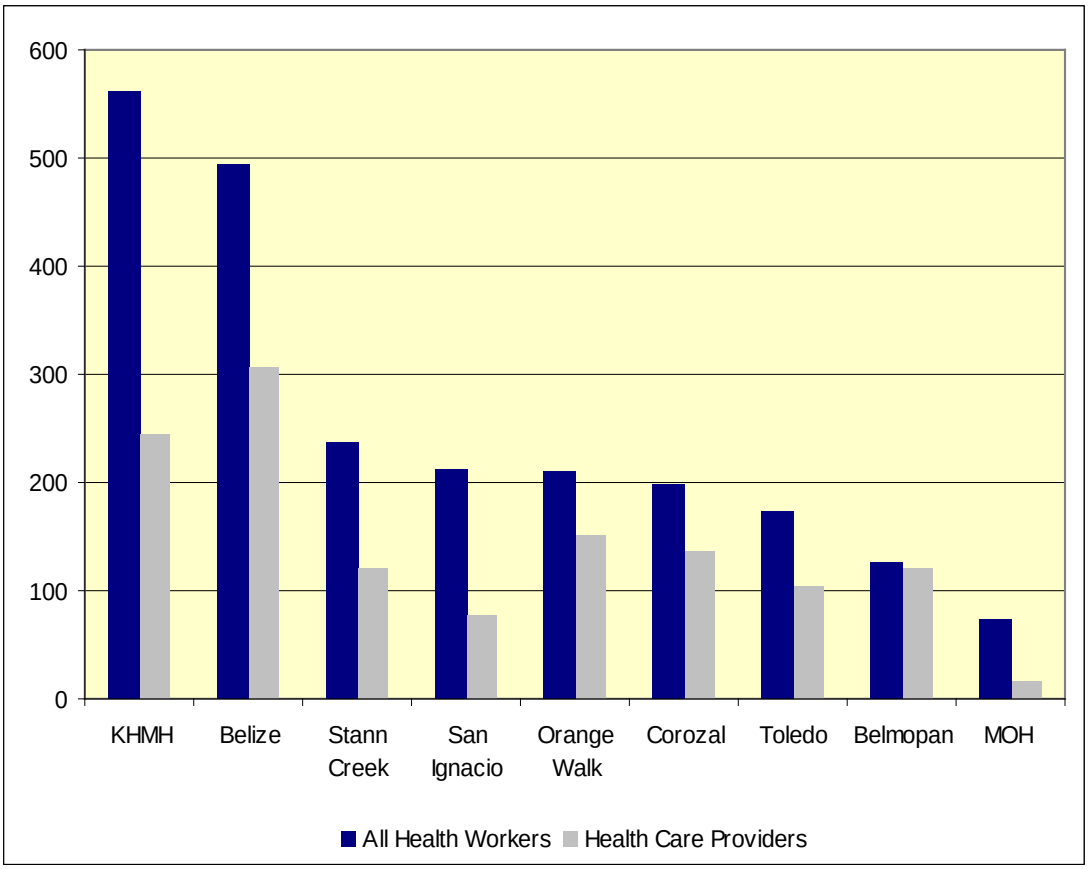
Total Health Workforce

In 2009, there were a total of 2283 workers employed in the health care industry as a whole in Belize, 1279 (56%) of these were health care providers while the remaining 1044 (44%) represented health management and support workers.

In 2006, WHO reported that world-wide health management and support workers constituted an average of 33% of the global health workforce. The Region of the

Americas at 43% recorded the highest figure in this regard, comparable to Belize's figure above. San Ignacio at 65.6% and KHMH at 56.6% had much higher percentages of support staff than average, while Corozal (31%) and Orange Walk (27.6%) reported much more modest levels.

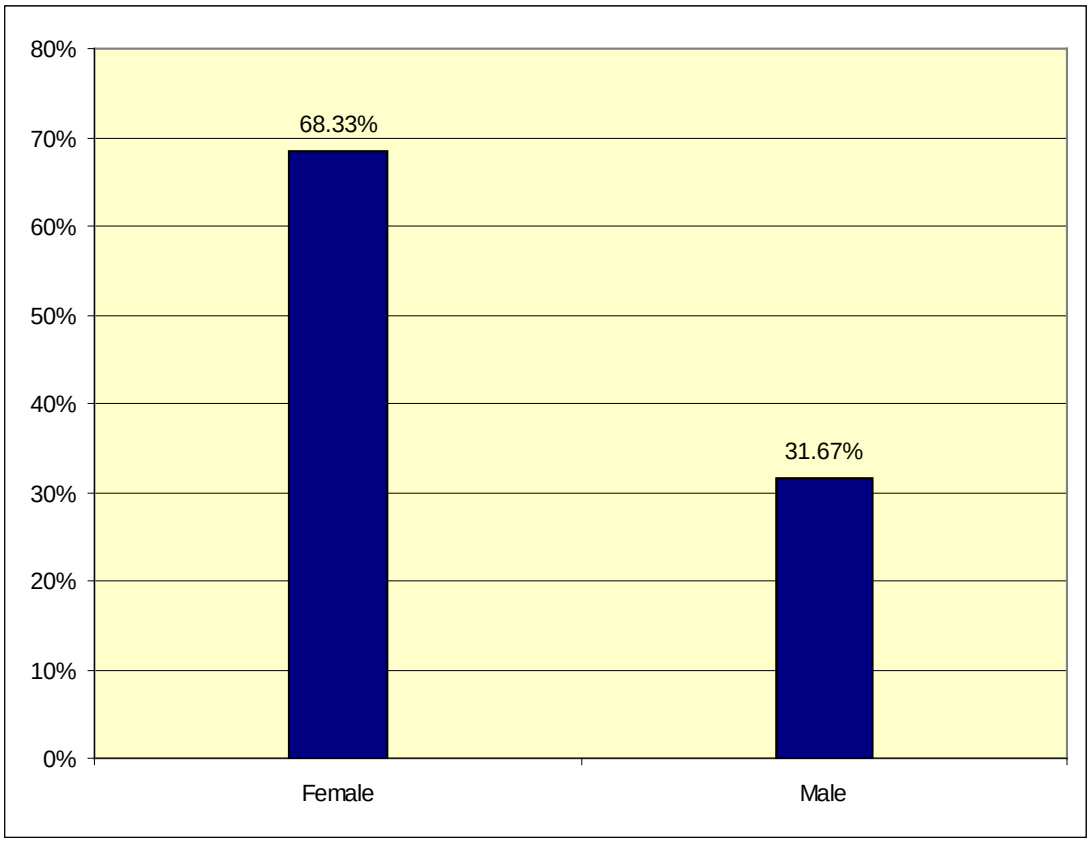
Figure 1: Health Workforce by District/Major Employer



Gender

Of the 1279 health care providers, the District of Belize (including the KHMH regional facility) employed 551, representing 43% of that total. Consistent with health care provider workforce trends throughout the Region of the Americas, women represent over 68% of the total, outnumbering men by a factor of 2.2 to 1. Women represent 94% of nurses, 92% of auxiliary nurses (i.e. nurses' aides with no formal training), 74% community health workers and 61% of pharmacists. One hundred percent of midwives are female. On the other hand, 65% of physicians, 62% of medical technicians and 72% of public health officers are men. In Canada less than 10% of nurses are male but women have surpassed men in admissions to medical schools. Attempts to attract more males into the health sector in attempts to provide more stability in the health workforce have met with only modest success throughout the Americas.

Figure 2: Health Care Providers by Gender



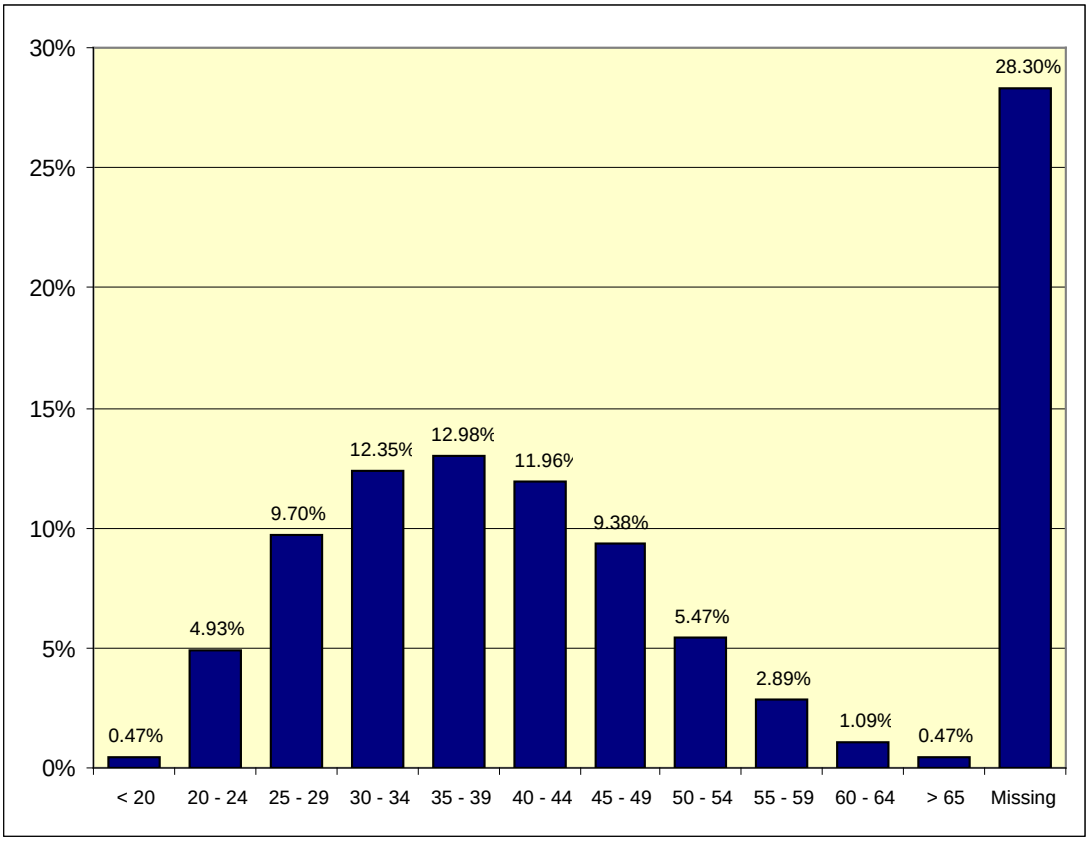
Age

With respect to age, about one in four health care providers are thirty to forty years of age. By comparison, the average age of doctors and nurses in North America is mid to late 40s, a full decade older that those in Belize. With a relatively young, well-distributed workforce with respect to age, it would appear that Belize will not have the mass exodus of aging health care providers from the workforce that many countries are expected to experience. Only 4.5% of Belize's health care providers are over 55 years of age, with 1.5% over 60. Of the major health provider groups, only nurses (3.6%), doctors (3.5%) and in particular, community health workers (12.7%), had workers over 55.

It is noteworthy however, that over the next decade attrition rates may increase as an additional 16% of nurses and 20% of community health workers reach that age. About 6.3% of the total population in Belize in 2002 was over 60. As the number of health workers over 55 is less than 4.5%, which is relatively low compared to other countries, it merits a deeper analysis of how many health care workers in Belize are retiring or leaving the workforce before 55 and what the impact might be on the country's future capacity for health service delivery. It is to be noted however, that data on year

of birth was only available for 71.1% of the health care providers, so more accurate data is need to make this investigation possible.

Figure 3: Health Care Providers by Age



Ethnicity/Languages Spoken

While health care providers represent over 30 nationalities and ethnic groups in Belize, Mestizo (32.8%) and Creole (28.1%) constitute about 61% of the total, with Garifuna, at 8%, is the next largest ethnic group, with Maya about 3.4% of the total. In 2002, the census in Belize indicated that Mestizo, Creole, Maya and Garifuna constituted about 53.2%, 25.3%, 10.1% and 6.9% of the population as a whole, respectively. This suggests that there is a representative number of Creole and Garifuna in the health workforce; however, there is a much less equitable distribution of Mestizo, with the number of Mayan health care providers by far the lowest.

In terms of languages spoken, 95% of health care providers could speak English while 480 (37.5%) could only speak English. About 41% of workers could speak English and Spanish, while 60 (4.7%) spoke only Spanish. It is expected that Cuban volunteers, who are 3.5% of the health care provider workforce in Belize, represent a significant proportion of the Spanish speaking workforce.

Occupational Distribution of Health Care Providers

With respect to the professional distribution of physicians, there were 181 general practitioners and 60 specialists; general practitioners outnumbering specialists by a factor of 3 to 1. In Belize there are six primary medical specialties, including Anesthetists, Obstetricians and Gynecologists, Internists, Orthopedic Surgeons, Pediatricians and General Surgeons. By comparison, there are over 100 recognized medical specialties in the United States with general /family practitioners constituting only about 10% of the physician workforce. By contrast—with its emphasis on primary health care teams and integrated health workforce deployment—general practitioners represent about half the total number of physicians in Canada.

One in five health care providers in Belize is a physician and over one in three is a nurse and together they represent 55.5% of the workforce. While in many parts of Latin America and the Caribbean physicians out-number nurses by a factor of three to one, the reverse situation is true in North America. In Belize, nurses outnumber doctors 1.95 to 1 (1.36 to 1 if practical nurses are excluded). Given the ongoing expanding role of nurses in primary health care, public health and community and long-term care throughout the Region of the Americas, a high proportion of nurses in the workforce has the potential to improve access to health care services. The nursing total (469) is comprised of 328 registered nurses (including rural, public health, psychiatric, operating room and nurse anesthetists), as well as 141 practical nurses.

The third largest group of health care providers is community health workers, the majority of which are uncertified community nursing aides who assist communities with patient referrals, first aid, administering injections, etc. Hospital-based medical technicians, including phlebotomists, x-ray technicians, radiographers and others, represent almost 10% of health workers. Pharmacists, public health officers, auxiliary nurses, midwives and dentists represent the final 22.3% of the workforce.

Table 1: Occupational Distribution of Health Care Providers

Category	Total	Percentage
Nurse	469	36.67%
Medical Doctor	241	18.84%
Community Health Worker	158	12.35%
Medical Technician	126	9.85%
Pharmacist	112	8.76%
Public Health Officer	60	4.69%
Auxiliary Nurse	59	4.61%
Midwife	42	3.28%
Dentist	12	0.94%
Grand Total	1,279	100.0%

Terms of Employment

The terms of employment can affect the overall stability of the health workforce. With respect to the total number of health care providers, only 38% have established positions that guarantee pension and health benefits and continuity of employment.

Auxiliary nurses and public health officers have the highest percentage of established positions at 71 and 60%, respectively.

There were 83 health care providers on contract, generally for a term of two years or less. Between 46 and 50% of nurse, midwife and medical technician positions are established compared to only 22% for physicians (plus 18% were volunteers) and 28% for pharmacists. Community health workers recorded the lowest figures with only 6.3% filling established positions with 89% of their workforce provided by volunteers. A higher proportion of established positions need to be targeted to stabilize health workforces, particularly community outreach programs in rural areas.

Health care provider volunteers (e.g. Cuban and Nigerian physicians) fill gaps and provide needed health care services but the stability and continuity of these arrangements over the long term are unknown. The volunteer contracts are generally for two years, but the term is variable based on the position and/or site location. Volunteers are paid by their own countries, although their housing and living expenses are provided for by Belize, and are filling established positions, i.e. permanent, funded positions designated for service that site/location. Unestablished and established positions filled by volunteers together represent over 23% of the health care provider workforce.

Table 2: Terms of Employment of Health Care Providers

Terms of Employment	Total	Percentage
Established	486	38.00%
Board	217	16.97%
Volunteer	171	13.37%
Private Practice	103	8.05%
Contract	83	6.49%
Unestablished	83	6.49%
Volunteer Cuban	44	3.44%
Against Post	9	0.70%
Missing	83	6.49%
Grand Total	1,279	100.0%

Employment Sector (Public-Private)

About 80% of health care providers are employed in the public sector, up from a figure of 75% in 2005. All community health workers and public health officers, and

about 88% of both auxiliary and professional nurses and 81% of midwives (many who are also qualified nurses) are employed in the public sector. About 30% of doctors, 44% of medical technicians and 46% of pharmacists are employed in the private sector, mostly in urban areas. It is unclear how many health care providers are employed in both the public and private sectors.

Geographic Distribution

While approximately half of nurses, medical technicians and pharmacists were stationed the KHMH or practiced in Belize City, the majority of auxiliary nurses, community health workers and midwives were employed in the rural areas of Orange Walk, Corozal and Toledo.

When the number of health care providers is compared across the districts with respect to their relative distribution per 10,000 population, differences in distribution begin to emerge. As expected with the presence of the country's regional hospital (KHMH), the District of Belize has the highest ratio of total health care providers overall with a figure of 57.4. The Cayo District had the lowest density of HRH per 10,000 population in the country with a ratio of 25.7, less than half the comparable figure for the District of Belize. The other districts had a fairly even distribution of human resources for health with ratios ranging from 31 to 37 health providers per 10,000 population, with an average of 39.7 for the country as a whole.

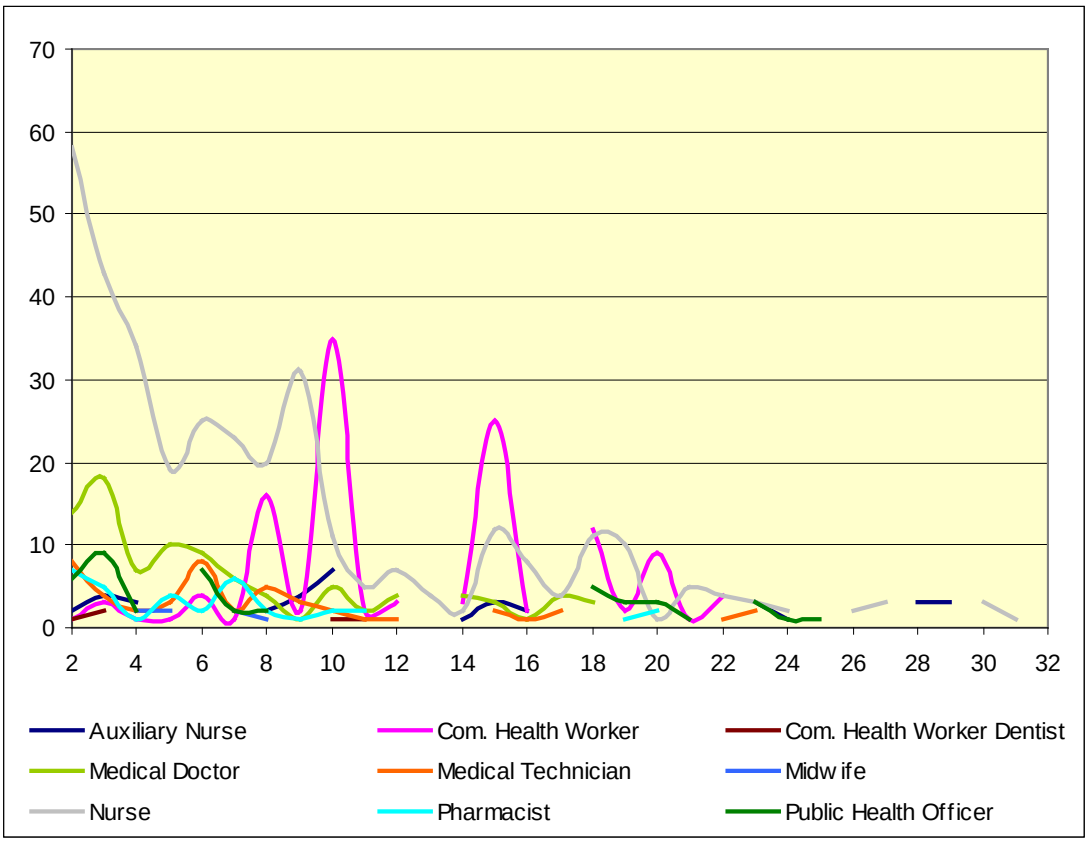
On the basis of individual professions, the distribution was much less even. Allowing for differences in population, Orange Walk had two and a half times the number of auxiliary nurses per 10,000 population than Corozal, Cayo and Toledo Districts. Similarly, Corozal and Toledo had a density of community health workers two and a half times that of the country as a whole. Corozal and Belize had the best supply of doctors and Belize and Orange Walk the greatest supply of medical technicians. Toledo and Corozal had two and three times number of midwives per 10,000 population as the country as a whole, while nurses were concentrated in Belize, Stann Creek and Orange Walk. Pharmacists and public health officers were relatively well distributed with the highest concentrations in the District of Belize.

Recruitment and Retention

Looking at the retention of a sample of nursing graduates from the University of Belize from 2003 and 2007, it is noted that only 50.6% of these graduates are currently working in the health field in Belize. Of the graduates who were retained, 80% did return to their home districts. The District of Belize had an 87% return rate while the District of Toledo at the lower end of the scale, still recorded a 50% return rate. In total, 80% of the University of Belize nursing graduates who were employed in the health industry returned to their home districts. Predictably, 40% of nurses were employed by KHMH.

With regards to the length of time that health care providers have been in their jobs, overall attrition from employment seems relatively low. The average number of years of employment for these health professionals is 9.5 years, with a range of from 2 to 37 years with a standard deviation of 6.97 years. About 29% of nurses have been employed four years or less, while 33.5% of community health workers, many of who are volunteers in rural areas where they reside, have been in their jobs for 8 to 10 years. Given that doctors are not produced locally, many are Cuban or Nigerian volunteers with employment contracts generally for two years, 13% have been employed for three years or less.

Figure 4: Health Care Provider by Duration of Employment



Urban-Rural Distribution

With respect to the urban-rural distribution of health care providers there were similar distribution concerns. Belize and Cayo Districts had virtually all of their health care providers (4.2% and 7.4%, respectively) in the urban centers. Again with the regional hospital in Belize City, this skewing of the distribution is to be expected. If we consider Corozal and Stann Creek individually however, 35% and 27.5% of health care providers in these Districts are employed in rural areas. In Toledo the distribution of providers is divided evenly (48.6 to 51.4%) between its urban and rural population. While 86.7%

of community health workers are located in rural areas, only 6.2% of doctors, 3% of nurses (including practical nurses) and 2.4% of midwives reside there.

The total number of urban providers out-numbered rural providers by a factor of 6.4 to one for the country as a whole. These figures are comparable to other countries in the Region of the Americas, with figures of 4 to 1 recorded in North America and 8 to 1 in parts of South America. With 52% of the population but only 13.6% of health care providers in Belize residing in rural areas, issues of relative access to health care services are underscored.

Health Care Professionals in 2005 and 2009

The number of health care professionals (physicians and nurses) in Belize exhibited consistent growth during the 1990's and reached the WHO target HRH density ratio per 10,000 population of 25 in 2005. By 2009 however, Belize's ratio had dropped to 18.8. Public health nurses supply fell from 12 to 8 and the number of physician volunteers dropped 46% from 63 to 34 over this period. Medical specialists experienced the most dramatic decline, falling from 159 in 2005 to 60 in 2009 (62.3%).

General practitioners recorded a modest growth of 9% and the number of registered nurses remained relatively stable with an increase of 2.2% between 2005 and 2009. Rural health nurse numbers increased 13, exhibiting the largest percentage gain overall (25%). Given that Belize's population growth over the comparable period was over 15%, the density of nurses and physicians per 10,000 population declined from 23.3 in 2005 to 17.7 in 2009. A stronger, more consistent growth in the supply of physicians (particularly specialists) and registered nurses will be required if Belize is going to keep pace with the health care needs of a growing population.

Table 3: Health Care Providers, 2005 and 2009

Category	2005	2009	Percentage Change
General Practitioners	166%	181%	9.0%
Specialists	159%	60%	-62.3%
MD Volunteers	63%	34%	-46.0%
Registered Nurses	321%	328%	2.2%
Public Health Nurses	12%	8%	-33.3%
Rural Health Nurses	52%	65%	25.0%
MDs per 10,000	11.8%	7.5%	-36.4%
RNs per 10,000	11.5%	10.2%	-11.3%
Private Sector	25.0%	20.2%	-19.2%

5.2. Summary and Implications

Summary

With respect to the health care provider workforce in Belize in 2009, a number of interesting points emerge:

- Since the year 2000, Belize's population has grown at a rate of more than 4% per year, averaging almost 6% in the Cayo and Belize Districts.
- About 52% of the population of Belize lives in rural areas.
- There were 2,283 workers employed in the health system in 2009, 1279 (56%) of whom were health care providers while the remaining 1004 (44%) were administrative and other support staff. About 43% of health care providers were employed in the District of Belize.
- Women are 68% of the health care provider workforce, outnumbering men 2.2 to 1.
- Belize's health care provider workforce is relatively young, 25% being in their 30s. Only 4.5% are over 55 years of age, but within a decade 16% of nurses and 20% of community health workers may be nearing retirement age.
- Mestizo and Creole, at 32.8% and 28.1% respectively, represent the largest ethnic groups in the Belize health care provider workforce, totaling 61%.
- Mestizo and Mayans represent 63.3% of the total population but are only 36.2% of the health care provider workforce.
- About 38% of providers speak only English, 5% speak only Spanish, while 41% speak Spanish and English.
- There are 181 general practitioners and 60 medical specialists working in Belize. The current density of physicians per 10,000 population is 7.5.
- Professional/registered nurses (excluding midwives) with a density of 10.2 per 10,000 population, outnumber doctors by a factor of 1.36 to one, or 1.95 to one if practical nurses are also included.
- Between 2005 and 2009, the number of registered nurses remained relatively stable while the number of specialists fell from 159 to 60. The combined ratio of registered nurses and physicians per 10,000 population dropped from 23.3 in 2005 to 17.7 in 2009.
- Only 38% of employment positions are "established," (permanent or secured positions) within the health workforce, while 23% of the positions are filled by either volunteers or 'precarious' workers (those without secure positions) such as contractors, part-time, short-term assignment or hourly workers.

- Cuban volunteers, representing about 3.4% of the total number of health care providers, are among the health care providers recruited from abroad to fill gaps in the delivery of primary health care services.
- Only about 20% of physicians are employed in established positions.
- About 80% of all health care providers (i.e. clinical workers and health professionals) are employed in the public sector.
- The District of Belize has the greatest density of health care providers relative to its population while the Cayo District has the lowest relative supply.
- Urban health care providers out-number rural providers by a factor of 6.4 to 1. Although 52% of the population of Belize live in rural areas, only 13.6% of health care providers reside there.
- Only about 51% of graduates from health training programs at the University of Belize between 2003 and 2007 are currently working in the Belize health care system.
- Of those retained however, about 80% of graduates returned to the districts in which they resided when they had applied to the University of Belize
- Overall attrition from employment, however, was relatively low with workers having been in their current jobs an average of 9.5 years.

Implications

It is important to note that in addition to the distribution concerns noted above, the total supply of health care providers in Belize remains relatively low. The growth in the number of health care professionals has not kept pace with the growth in the population.

The optimal target recommended by WHO suggests that 25 health care providers (doctors, nurses and midwives) per 10,000 population are needed to provide basic health care services. In the year 2000, fifteen of the forty-seven countries in the Region of the Americas were below this optimal level. While Belize had managed to reach this minimum target in the year 2000 and again in 2005, its density of HRH per 10,000 population appears to have fallen significantly over the past four years.

The density of HRH per 10,000 population in Belize in mid 2009, however, had slipped to 18.8, well below the target figure. Only by adding practical nurses and practical nurse midwives to the total mix of HRH, and by applying lowest population estimates for Belize, can we approximate the target figure of 25.

It is estimated that a net annual growth of 32 physicians, nurses and midwives (almost 200 in total) would be required for Belize to reach the optimal target of 25 per 10,000 by the year 2015. In view of the fact that the population of Belize has increased

about 4% annually in recent years, an additional 26 practitioners would be required each year to accommodate this growth, for a grand total of 58. Also a comparable number of new employment positions would need to be created, funded and filled to employ these additional health care providers.

Additional health care providers would also be needed to compensate for natural annual attrition (retirement, out migration, etc.) from the health workforce. This amount does not consider that Belize needs to go beyond the basic minimum ratio, nor does it factor in the need to become more self-sufficient with regard to its dependence on foreign health care workers to fill current employment gaps.

The above figures are reason for concern, especially noting that Belize does not have a medical school and is dependent upon Belizeans receiving their medical training in other countries and upon volunteer and immigrant physicians to meet its medical service demands. Furthermore, student attrition at the University of Belize, and a less than optimal uptake and placement of graduates within the health care system, further amplify these concerns.

6. University of Belize

6.1. Faculty of Nursing, Allied Health and Social Work

In 2007, the University of Belize had an enrollment of 2,471 students in four faculties with a total of 48 different training programs. Faculty and staff totaled 300. The University of Belize has linkages with 45 international training programs in other educational institutions abroad.

The University of Belize (UB), through its Faculty of Nursing, Allied Health and Social Work, offers programs in nursing, midwifery, practical nursing, rural health nursing, public health nursing; pharmacy, medical laboratory technology, public health inspectors, and social work. UB graduates between 60-90 non-physician health care providers annually. The curricula for undergraduate level programs are under review by the Faculty. The limited pool of qualified health professionals to teach certain specialized subjects poses a continuing challenge for the University.

Belize does not have a national medical school. Belizean students utilize scholarship opportunities provided under bilateral technical cooperation agreements, particularly with Cuba, and to a lesser extent, Mexico and Taiwan. Most medical professionals are trained in Mexico and Central American countries, i.e. Guatemala, Costa Rica, and Nicaragua. As a Caribbean sub regional training institution, the University of the West Indies (UWI) is mandated by CARICOM to provide space in its School of Medicine for students from Belize. Dentists are trained largely in Guatemala.

Belizean students have been enrolled in the bachelor of nursing program at the University of the West Indies (UWI) since 2006. While there were 10 students in the program in 2007, the number of students enrolled in 2009 is 23.

Continuing education opportunities in a wide range of medical issues and health knowledge and skills areas are provided to health professionals in Belize based on supply from local and international trainers, and through the professional associations. However, these are not part of a structured program for the management, development and continuing education of HRH. Targeted but temporally ad-hoc training initiatives in relevant skill areas are provided to semi-professionalized health care providers such as community health workers and traditional birth attendants. Certification mechanisms for health workers are administered by the professional councils of the various health professions. Nurses must past Regional certification exams under the

CARICOM agreement if they are to have their training and credentials recognized by other member countries in the Caribbean. The establishment of a Human Resources Development and Management Unit in the MoH will address staff development, program coordination and long-term planning.

Programs

The Faculty of Nursing, Allied Health and Social Work consists of two Departments. The Department of Allied Health and Social Work offer four Associate degrees and one Bachelor's degree through its Belmopan and Belize City campuses. These include two-year Associate degrees in Environmental Health, Pharmacy and a three-year Associate degree program in Medical Laboratory Technology. An Associate degree, as well as a Bachelor's degree, are offered in Social Work. While most courses are for students on a full-time basis in Belmopan, both Social Work degree programs can be pursued part-time in Belize City. Each program has an internship component.

The Department of Nursing offers four one-year Certificate programs in Midwifery, Psychiatric Nurse Practitioner, Practical Nursing and Rural Health Nursing, through its Belmopan Campus. The Department also offers four-year Baccalaureate programs in Professional Nursing and in Public Health Nursing. These programs are full-time and offer several internship components. Students engage in theory classes for ten weeks and then internship for the rest of the semester. A three-year Diploma in Professional Nursing had been formerly offered but the program was discontinued in the year 2000. Currently no post-graduate training at the Masters or Doctoral level are offered by the Faculty of Nursing, Allied Health and Social Work at the University of Belize.

Curriculum

In the first semester, the Social Work curriculum includes policy and human rights, while the Pharmacy program includes a course in jurisprudence and ethics. Nursing and Public Health Nursing programs include courses in community health nursing and the foundations of public health nursing, respectively. In the second semester, courses are offered in health education in primary health care, socio-cultural practices in health and diseases, health system management, nursing management and leadership, patient counseling, social work within families and communities and work ethics and critical thinking.

The health system management course in the Public Health Nursing program demonstrates the breadth and scope of the course work. This course introductions organizational management concepts and applies them in analyzing strategic, managerial and financial issues within the health care system. Course objectives include defining a leadership role recognizing managerial styles, behavioral issues and challenges across a variety of health care settings, the impact on the organization and structure of the health care system on the delivery of health services and the impact of the health services workforce on the outcome and performance of the care delivery system. Factors affecting access to care (individual, physical environment, social and

cultural factors) are reviewed as well as health promotion and disease prevention, the roles of various health professions and issues in quality of care.

6.2. Health Training Program Trends, 2000 to 2009

This section of the report provides a summary of health program graduates from the University of Belize contained in Tables 1 to 21 in Appendix C.

Applicants and Student Admissions

Total number of applicants to health training programs at the University of Belize was 7,247 over the past nine years, with a total of 484 applicants in the year 2000 increasing to 1397 in 2008. While the District of Belize applicants made strong numerical gains from 275 to 624, Toledo District showed stronger proportional gains, increasing from 12 to 98 (eight- fold) over the comparable period. Nursing represented 31.8% of the total number of applicants.

In terms of the total number of applicants per 10,000 population, the relative proportion of applicants to health training programs more than doubled in this 9-year period, increasing from 20.1 in 2000 to 42.9 in 2008.

In the year 2000, the District of Belize had eight times the number of applicants per 10,000 population compared to Toledo District, but by 2008, Toledo's number of applicants relative to its population size had increased to half that of the District of Belize (32.6 and 65, respectively). The strongest gains in proportional representation of applicants were in the Districts of Toledo, Stann Creek and Cayo. Although Orange Walk District doubled its number of applicants per 10,000 population, it had the lowest number of applicants overall. In terms of relative increases in total applicants over the eight year period however, Corozal District produced the lowest figures increasing from 15.6 to 22.2, dropping from third to fifth place standing overall. By and large, however, applicant numbers continued to increase over the decade, with strong gains being consistently recorded outside of the District of Belize.

The percentage of applicants who were admitted was consistently high across all districts, with a range of 82.5% 87.9% between 2000 and 2008. With respect to the health professions, between 2000 and 2007 there were 231 applicants to the midwifery program of which 193 (83.5%) were granted acceptance. Between 2001 and 2008 however, there were only 53 midwifery graduates for an approximate program completion rate of only 27.5% for that period.

Although the applicant acceptance rate is high, the registration rate for accepted applicants is much lower. In nursing, for example, the percentage of successful applicants who actually registered for the program was between 53% and 60% between 2002 and 2007 to 71% in 2008. Although there were 91 nurses who registered in the

baccalaureate program between 2002 and 2005, there were only 57 graduates of the four year program between 2006 and 2009, for an approximate completion rate of 62.6%. The completion rate for nurses is higher than the average for health training programs as a whole (51%) while the midwifery rate above was considerably lower.

Graduate Demographics

Over the past nine years, 528 students have graduated from the Faculty of Nursing, Allied Health and Social Work at the University of Belize, averaging about 53 per year. In 2008 and 2009 there were 72 and 73 graduates, respectively, the greatest number over the past decade. Of this total number, 82.4% of graduates were female. By comparison, 68.3% of the health care provider workforce were women. If we exclude physicians from the country total to make the figures more comparable (medicine is a male dominated profession not trained in Belize), the figure for females in the health workforce increases to 76.8%. It appears that the health professions as a whole are—and will continue to be for the foreseeable future—dominated by female practitioners.

The age of graduates varied across programs. Social work graduates were the oldest with 15% of the total being over fifty years of age. The distribution of graduates was even in each age cohort from their late twenty's through to their forty's, averaging about 17 per year for females. While approximately two-thirds of nurses, practical nurses and pharmacists all graduated in their twenties, most professional nurses and midwives graduated in their early thirties with a broader overall age distribution of graduates. About 1 in 4 professional nurses and 1 in 3 midwives who graduated were between forty and fifty years of age. Between 2000 and 2004, there tended to be more graduates in their thirties (49%), but between 2005 and 2009, the majority of graduates (58.9%) were in their twenties. The discontinuation of the professional nursing diploma program in 2000 may have had an impact on this shift.

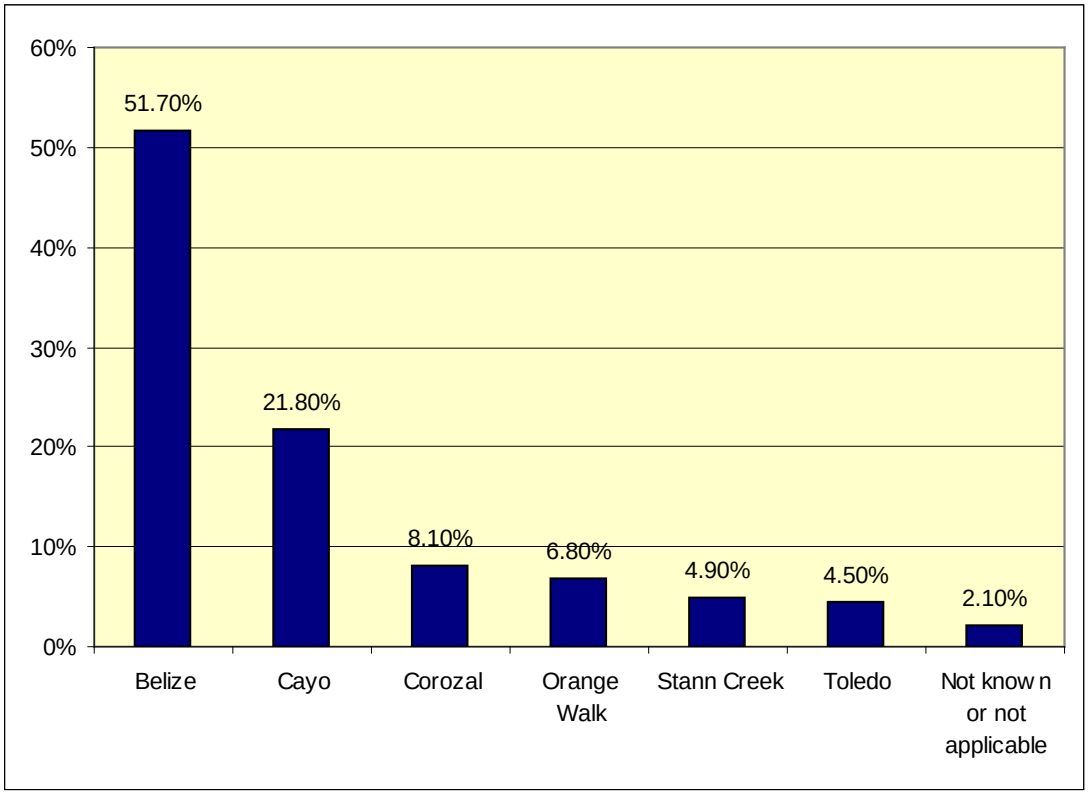
Ethnicity/Languages Spoken

While Creole are 25.3% of the population (2002), and 28.1% of health care providers, they represent 40.7% of health graduates—the largest representation of any ethnic group. Similarly Garifuna, while only 6.9% of the population and 8.0% of the workforce, were the third largest ethnic group among health professional graduates at 13.6%. Mayan and Mestizo were far less represented among health care provider graduates. Mayan were 10.1% of the population but only about 3.5% of graduates, while Mestizo were 53.2% of the population and 24.6% of graduates. With respect to languages spoken, 49.4% of graduates spoke English, compared to 37.5% of the health workforce. By contrast, only 24.4% of graduates spoke Spanish and English, compared to 40.9% for health care providers as a whole.

Geographic Distribution

Approximately 52% of graduates from the University of Belize were from the District of Belize, although the District represents only 30% of the population. By contrast, only 16.2% of graduates were from the Districts of Orange Walk, Stann Creek and Toledo combined; although these districts represented 34.6% of the population. About 22% of graduates were from the Cayo District, similar to its share of the total population of Belize.

Figure 5: University of Belize Health Program Graduates by District



In terms of cities and towns, Belize City, Belmopan, Punta Gorda and San Ignacio were well represented with 57% of health program graduates, but the Corozal, Dangriga and Orange Walk share of graduates was only about half their relative share of the total population of Belize. Overall, Benque Viejo has the lowest percentage of graduates (0.9%) relative to its population share (5.6%).

It is interesting to note that while the urban-rural distribution of the population is approximately even (47.8% to 52.2%), a full 78.6% of the health professional graduates were originally from urban areas. Only 104 of the 486 graduates for which addresses were know at the time of admission to the University of Belize, were from rural areas. As such, urban graduates outnumbered graduates from rural areas by a factor of 3.7 to one.

Professional Program Distribution

With respect to credentials granted by the University of Belize between 2000 and 2009, 41.5% were three-year associate degree graduates, the majority of these (74%) were in Pharmacy and Social Work. One year certificate programs in midwifery and practical and psychiatric nursing were 24% of the total number of graduates. Four year bachelor's programs in Nursing and Social Work graduated 38 social workers and 78 nurses, represented 22% of the total. Sixty-four professional diploma nurses also graduated; although the program was discontinued by the University of Belize in the year 2000. There was a marked difference in the type of degree granted between districts. While both Belize and Cayo produced equal numbers of certificate and bachelor's degree graduates in their respective districts, Corozal, Orange Walk, Stann Creek and Toledo produced an average of 1.9 times more graduates with one-year certificates than four-year degrees.

Although the number of graduates between the year 2000 and 2009 increased from 23 to 73, with an average output of 53 per year, graduate numbers by year and by program displayed wide variation. Midwifery graduates ranged from a low of 5 in 2009 to a high of 26 in 2002 with five of the past ten years producing no graduates at all. Although the professional nursing diploma program was discontinued in the year 2000, the last of those students didn't complete the three-year program until 2004. Similarly, the nursing baccalaureate program, which did not produce any graduates until 2004, exhibited a range from 5 to 26 graduates in 2006 and 2008, respectively. Over the past ten years the only psychiatric nurse practitioner graduates that were produced was between 2005 and 2007. While medical laboratory technology, practical nursing and pharmacy programs graduates were produced each year, the output ranged from 1 to 15 per year over this period.

Table 4: Health Program Graduates by Major & Type of Degree Granted

Major	Type of Degree Granted				Percentage
	Associate	Bachelor	Certificate	Diploma	
Social Work	83	38			22.92%
Pharmacy	79				14.96%
Nursing (BSc)		78			14.77%
Professional Nursing				64	12.12%
Midwifery			58		10.98%
Practical Nursing			58		10.98%
Medical Laboratory Technician	51				9.66%
Psychiatric Nurse Practitioner			13		2.46%
Environmental Health	6				1.14%
Total	219	116	129	64	100.0%

Student Success and Program Completion

Student completion rates in the health programs were examined at the University of Belize for students who entered training between 2001 and 2005, and who then graduated between 2002 (one-year midwifery program) and 2009 (four-year nursing program). The overall completion rate for all programs over the five year period was 34.2%, ranging from a low of 28.1% for entrants in 2001 to a high of 46.2% in 2003.

The highest completion rates were for the one-year certificate program in midwifery (58%) and in pharmacy (57%), with nursing at 34.4% near the overall average for all health training programs. While less than optimal, this figure is comparable to other countries in the Region of the Americas which have estimated completion rates of about 25%.

Consistent with the CARICOM agreement, nurses must sit a standard exam to ensure consistent educational standards across the region. This facilitates the free movement of registered nurses to practice their profession throughout the Caribbean. However, the individual health training programs at the Faculty of Nursing, Allied Health and Social are not currently accredited.

Between 2000 and 2009, 117 nursing graduates wrote the nursing examination an average of 1.62 times before achieving a passing grade. There were a total of 78 baccalaureate nursing graduates and 64 diploma nursing graduates from the University of Belize over that period, suggesting that about 82% of the total number of graduates wrote and eventually passed the certification exam.

The average annual pass rate, however, was 50.5% for the ten nurse graduating classes between 2000 and 2009. The success rates in writing the nursing exam exhibited considerable variation from year to year over that period. Between 2000 and 2005, 61.3 of the nurses who wrote the certification exam achieved a pass while only 16% were successful between 2006 and 2008. In 2009, 14 out of 16 nurses (87.5%) who wrote the exam passed. It is unclear; however, how many Belizean nurses were passing the exam on their first attempt in the year in which they graduated. A high number of nurses repeating the exam would tend to inflate the overall pass rate in that year. By district, the pass rate for nurses in the district of Belize was 44.1%, 58.5% in Cayo and 66.7% in Corozal. Although the numbers were small, there were no exam failures recorded for the other three districts.

Student Scholarships

Of the 528 graduates between 2000 and 2009, 260 (49.2%) had been awarded scholarships. While this figure would also include students on scholarships from other countries, the majority of these would be provided by the Belize government. Compared to only about one-third of professional and practical nursing programs, 60% of nurses in the baccalaureate program nurses were supported by bursaries. The psychiatric nurse practitioner program recorded the highest levels of support with twelve

of the thirteen graduates having been on bursaries. On a district basis, Stann Creek and Cayo had the highest percentage of graduates who had received bursaries at over 57%, while Corozal had the lowest representation at about 35%.

6.3. Summary and Implications

Summary

With respect to graduates from the health training programs at the University of Belize:

- Application rates to the health training programs at the University of Belize have doubled over the past decade.
- While applicant acceptance rates in the health training programs are often over 80%, student registrations are only between 53 and 60%.
- Orange Walk and Corozal Districts and Mestizo and Mayan ethnics groups are not well represented among applicants to health training programs.
- The program completion rates for students in health training programs between 2001 and 2005 was only 34%.
- There were over 7,000 applicants to health training programs at the University of Belize over the past decade but only 528 graduates.
- The number of graduates produced annually from each of the nine health training programs exhibited wide variation between 2000 and 2009. For example, while there were 26 midwifery graduates in 2002, no graduates were produced between 2004 and 2006. Similarly, the number of nursing graduates varied from a low of 5 in 2006 to a high of 26 in 2008.
- Although 52% of the population is rural, only 21% of graduates were from rural areas.
- Of 142 nursing graduates in recent years, 117 elected to take the nursing certification exam. Only about 50% of nurses pass the certification exam in any one year. Nurses wrote the nursing examination an average of 1.62 times before achieving a passing grade, though only about 68% pass the exam overall.
- About 50% of students in health training programs received scholarships with a proportionately higher number of students from Cayo and Stann Creek receiving assistance.
- Belize's ratio of physicians, nurses and midwives per 10,000 population is only 18.9. A total net growth of 32 physicians, nurses and midwives per year

are needed to reach a HRH density of 25 per 10,000 by 2015—plus an additional 26 annually to accommodate ongoing population increases—for a grand total requirement of 58 per year.

- The average output from all health training programs at the University of Belize over the past decade has been 53 annually. The output from the nursing and midwifery training programs has averaged less than 14 graduates per year, well below anticipated requirements.

Implications

While effort needs to be made to further broaden the applicant pool to make it more representative of the population, it is equally important to determine and address issues to boost the registration rates of students who have been accepted into health programs.

It is estimated above that a net gain of 35 nurses and midwives would be needed annually to meet the WHO optimal workforce target. Nurses and midwives have averaged only 13.5 graduates per year over the past decade, far less than the expected requirement.

Student enrollments will need to be increased, the number of and range of scholarships offered will need to be expanded, student health program completion rates will need to be increased, certification exam pass rates will have to be improved and established employment opportunities for health care graduates will have to be augmented.

If these steps are not taken to better align the output of the University of Belize with HRH needs of the health care delivery system, it is unlikely that Belize's health reform goals and health system performance targets will achieved.

7. Conclusions and Recommendations

It is estimated that the current ratio of health care providers per 10,000 population in Belize is 18.9, below the WHO recommended optimal ratio of 25.

A net annual growth of 59 health care providers will be required just to keep pace with Belize's population growth of 4.3% each year.

A net gain of 26 physicians, nurses and midwives will be needed to accommodate population increases, while a further 32 per year will be needed to meet the target of 25 per 10,000 population by the year 2015, for a grand total of 58 annually.

As such, steps that may be effective for consideration at the policy and program levels include:

- Increase student enrollments in health programs at the University of Belize.
- Increase the uptake of applicants who have been accepted into health programs.
- Recruit more students from rural areas and ethnic populations.
- Expand the number and range of scholarships across programs and districts;.
- Reduce student attrition.
- Enhance graduate retention rates.
- Improve graduate certification exam pass rates.
- Significantly augment the number of employment opportunities for health professional graduates.
- Increase the proportion of "established" employment positions.
- Expand e-learning opportunities, such as offered by the open university of UWI.

With targeted policies to address improved alignment between the representative output of the University of Belize and the HRH needs of the population, it is likely that Belize's health reform and health system performance targets will be achievable.

While the focus of this review is on the inventory of the health workforce of Belize, the scope of these recommendations include the identification of the critical conditions necessary to develop and support an effective HRH planning system. Improvements in capacities to plan HRH through enhanced data development and regional partnerships are central to achieving this goal.

While individual capacities and resources differ across health regions, there are significant opportunities and benefits to building upon a common HRH planning foundation. Common data definitions, further software development, assumption exploration and consistent approaches to planning can be developed collaboratively and best practices and lessons learned can be shared across regions. A common framework, approach and understanding of key planning concepts, including the overall scope and range of strategic options available, would be an important place to begin.

Some of the components of that collaborative foundation are set out below.

7.1. Strategic Planning

Issue:

Currently there is no consistent, country-wide, on-going mechanism to coordinate HRH planning activities and to bring the broad range of players together in a common forum to collaboratively share both current best practices and future concerns in the management of the health care delivery system across health regions.

Recommendations that may be useful and that fall in line with the country's commitment to the framework of the 20 goals for HRH development are:

- A formal, permanent HRH Advisory Committee be established and chaired by the MoH, with representatives from education, labor and finance, as well as private sector and international organization contribution, to: (i) advance research in HRH; (ii) liaison between research and informed policy recommendations; (iii) contribute to forums and debate that address specific workforce needs and strategies; and, (iv) disseminate information on best practices, experiences, research findings and progress resulting from policy implementation.
- Some of this work would be specifically to bring together the appropriate decision-makers—government departments including the Ministries of Health, Public Service, Education and Finance, HRH planners and employers, district managers, health professions, unions, PAHO and the University of Belize—to

develop a plan to ensure maximum relevance and optimal alignment of HRH activities with the long-term needs and priorities of Belize's reformed health care delivery system.

- An appropriately supported and resources, permanent HRH Planning Unit or position be established within the MoH to ensure a coordinated, country-wide approach to the planning and management of HRH to optimally support the health care delivery system in meeting the current and long-term health care needs of the people of Belize.

While it is recognized that the MoH has already begun these HRH activities and is providing support in these areas, this recommendation is intended to further reinforce the need to broaden the scope of these activities to ensure that the current momentum in HRH planning continues, that effective planning partnerships are expanded and that the capacity of the MoH to manage these issues is strengthened.

7.2. Data Development

Issue:

While basic information is collected for personnel management within the health regions, more detailed, consistent and accurate HRH supply data needs to developed, collected and monitored. Additional complementary, standardized minimum data sets are needed to measure population health needs (a range of health status indictors) and to measure and monitor changes in both workforce stability (turnover, vacancy, absenteeism, migration and workforce participation rates) and efficiency (workforce deployment and the overall cost-effectiveness of service delivery).

Performance indicators are needed to establish benchmarks and to measure the ongoing impact of health policy and program changes on health care delivery and the health workforce to ensure that targets are being met and appropriate contingency plans are being developed as needed.

Recommendations that may be useful for consideration:

- The HRH data set developed for this project be formalized, expanded and included in the Belize Health Information System to facilitate integrated HRH planning, policy and program development and fiscal management.
- A process for information sharing, gathering analyzing and interpreting be led and sustained by the Belize HRH Observatory in support of the HRH strategic planning unit/position in the MoH to inform policy decisions, to respond to direct information requests from MoH decision makers, and to track and report on progress, changes, and trends in the HRH and in health outcomes—possibly resulting from targeted policies and program implementations.

- Coordination with PAHO to adapt a standardized method of inputting and reporting on HRH core data.
- Data bases be standardized, as far as practicable, to support cross-linkages at core data levels (educational, employment, professional registries, etc.) and to enhance the capacity for inter-regional comparisons.
- A unique identifier for health workers be developed to permit the inter-jurisdictional (including intra-Regional) tracking of health professionals throughout their work-life cycles and facilitate long-term HRH planning, research and evaluation.
- An HRH Data Inventory be developed to support HRH planning and facilitate the identification of data gaps and data development priorities.
- A ongoing data system, linked to the MoH's health workforce data base, be developed to monitor and track graduates from the University of Belize's Faculty of Nursing, Allied Health and Social Work, as well as Belizean graduates from other schools within the Region.
- Over the long-term, minimum data sets and common performance indicators be developed for population health, for overall workforce stability and for productivity efficiency (including fiscal indicators) to strengthen HRH planning scope and capacity.

7.3. Research

Issues:

A summary of the existing research and reports with the Region of the Americas on HRH plans and activities would strengthen and support HRH planning in Belize generally. Research that identifies the challenges and conditions critical to the success of implementing any proposed new HRH policies or programs would benefit government planning and decision-making. A synthesis of current research would provide a quick and cost-effective way to identify initial HRH trends, priorities and policy and program options that have achieved success elsewhere in the Region of the Americas and may be worthy of closer consideration in Belize.

In view of the key role that HRH plays in the health care system, it is important that HRH feature prominently in the planning, costing and implementation of the government reform agenda regarding the delivery of health services.

Useful considerations in advancing the research agenda:

- Partnering between the MoH and research institutions and the University of Belize may be useful in achieving more information to guide decision mak-

ing and evaluate the efficacy of initiatives and policies. At the same time, this partnering will continue to build capacity in research and evaluation in the country.

- Use of the Belize HRH Observatory to promote, guide and liaison the information from such a research partnership between the MoH and universities and institutions may be helpful.
- Recruiting input and recommendations from other sectors such as professional organizations and councils may be useful as it makes it easier to get information and to achieve consensus in policy decisions.
- Establish communications strategies to inform contributors, stakeholders, and interested parties of research results and related policy considerations so that actors in the health field, providers, and users will be aware that their concerns are being addressed by the MoH.
- In alignment with the country's commitment to the 20 goals of HRH development of the Resolution. Important areas for research may include:
  - PHC delivery models.
  - HRH deployment and the resultant impact.
  - HRH efficiency and effectiveness and overall improvements in health outcomes in various PHC team models, mix of professions, and in various workplace environments.
  - recruitment and retention strategies and their impacts.
- Costing options and in-kind improvement investments should also be researched and analyzed.

7.4. Evaluation

Issues:

Although HRH planning models have been evolving for the past two decades, very few have been thoroughly evaluated in terms of their scope, viability, costs, output and overall capacity to appropriately inform and influence government decision-making processes.

Areas needing attention that were revealed in this study and merit evaluation for strategic planning purposes:

- The role, size, curriculum and admission policies of the University of Belize's Faculty of Nursing, Allied Health and Social Work be reviewed to determine

what changes and resources may be necessary for it to be as supportive as possible of the needs of Belize's reformed health care delivery system.

- A thorough analysis of the cost-effectiveness and overall efficacy of Belize's current physician recruitment and retention programs and policies, including the role of the physician volunteer program, with respect to meeting the anticipated long-terms needs of the health delivery system.
- The WHO draft Code of Practice for the International Recruitment of Health Care Workers be reviewed with respect to Belize's HRH needs and its capacity to become more stable and self-sufficient with respect to HRH supply over the longer term. Belize's current approach to physician recruitment should be closely considered in this context.

In terms of first steps, it is suggested that a broad-based, formal HRH planning mechanism be established—that expands on as is supportive of the current work of the Observatory—to collaboratively identify and manage HRH issues and priorities. The creation of a timely, accessible, accurate and comprehensive HRH data system linked to the Belize Health Information System may be an important place to begin.

APPENDIX A
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Contacts

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- Dr. Beverley Barnett, PAHO/WHO Representative
- Ms. Marilyn Entwistle, Advisor, Health Systems and Services (term began July 2009)
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- Ms. Allison Annette Foster, Regional Advisor, Human Resources for Health

APPENDIX B
BELIZE HEALTH CARE PROVIDER WORKFORCE
AUGUST 2009[7]

Table 1: Total Number of Workers Employed in the Health Industry by Region/Major Employer

Region/Major Employer	Total	Percentage
KHMH	562	24.62%
Belize	493	21.59%
Stann Creek	236	10.34%
Stan Ignacio	212	9.29%
Orange Walk	210	9.20%
Corozal	197	8.63%
Toledo	174	7.62%
Belmopan	126	5.52%
MoH	73	3.20%
Grand Total	2,283	100.0%

Table 2: Total Number of Health Care Providers by Region/Major Employer

Region/Major Employer	Total	Percentage
Belize	307	24.00%
KHMH	244	19.08%
Orange Walk	152	11.88%
Corozal	136	10.63%
Belmopan	120	9.38%
Stann Creek	120	9.38%
Toledo	105	8.21%
San Ignacio	78	6.10%
MoH (Belmopan)	17	1.33%
Grand Total	1,279	100.0%

7. All employment data contained in Appendix B was collected and verified during July and August, 2009.

Table 3: Total number of Health Care Providers by Gender

Gender	Total	Percentage
Female	874	68.33%
Male	405	31.67%
Grand Total	1,279	100.0%

Table 4: Age Group of Health Care Providers

Age Group	Number	Percentage
< 20	6	0.47%
20 - 24	63	4.93%
25 - 29	124	9.70%
30 - 34	158	12.35%
35 - 39	166	12.98%
40 - 44	153	11.96%
45 - 49	120	9.38%
50 - 54	70	5.47%
55 - 59	37	2.89%
60 - 64	14	1.09%
> 65	6	0.47%
Missing	362	28.30%
Grand Total	1,279	100.0%

Table 5: Ethnicity/Nationality of Health Care Providers

Ethnicity/Nationality	Total	Percentage
Mestizo	420	32.84%
Creole	359	28.07%
Garifuna	102	7.97%
Nigerian	78	6.10%
Maya	44	3.44%
Cuban	29	2.27%
East Indian	21	1.64%
Ketchi	13	1.02%
African	12	0.94%
Indian	9	0.70%
Mennonite	7	0.55%
Guyanese	4	0.31%
Nicaraguan	4	0.31%

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Ethnicity/Nationality	Total	Percentage
continuation of Table 5...		
American	3	0.23%
Guatemalan	3	0.23%
Taiwanese	3	0.23%
Housa	2	0.16%
Latin	2	0.16%
Filipino	2	0.16%
Arab	1	0.08%
Black	1	0.08%
Brazilian	1	0.08%
British	1	0.08%
Caucasian	1	0.08%
Chinese	1	0.08%
Ghanaian	1	0.08%
Hindu	1	0.08%
Iranian	1	0.08%
Negro	1	0.08%
Norwegian	1	0.08%
Salvadorian	1	0.08%
Scottish	1	0.08%
Missing	149	11.65%
Grand Total	1,279	100.0%

Table 6: Language(s) Spoken by Health Care Providers

Language Spoken	Total	Percentage
English/Spanish	524	40.97%
English	480	37.53%
English/Garifuna	68	5.32%
Spanish	60	4.69%
English/Maya	39	3.05%
English/Ketchi	13	1.02%
English/Yoruba	8	0.63%
English/Ibo	7	0.55%
English/African (Nigerian dialect)	7	0.55%
English/Spanish/Garifuna	6	0.47%
English/Spanish/German	6	0.47%
English/Spanish/Maya	4	0.31%

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Language Spoken	Total	Percentage
continuation of Table 6...		
English/Hindi	3	0.23%
English/Housa	2	0.16%
English/Mandarin	2	0.16%
English/Spanish/Hindi	2	0.16%
English/Spanish/Ketchi	2	0.16%
English/German	1	0.08%
English/Spanish/Mandarin	1	0.08%
English/Spanish/Portuguese	1	0.08%
English/Tagalog	1	0.08%
Missing	42	3.28%
Grand Total	1,279	100.0%

Table 7: Employment Post/Position of Health Care Providers

Post/Position	Total	Percentage
Staff Nurse/Registered Nurse	182	14.23%
Practical Nurse	141	11.02%
Community Nurse Aide	140	10.95%
General Practitioner/Medical Officer	127	9.93%
Others	96	7.51%
Pharmacist	79	6.18%
Rural Health Nurse	65	5.08%
Auxiliary Nurse	59	4.61%
Medical Technician	46	3.60%
Registered Nurse/Staff Nurse Midwife	28	2.19%
Public Health Inspector	27	2.11%
Environmental Assistant	24	1.88%
Psychiatric Nurse Practitioner	19	1.49%
Dispenser	17	1.33%
Radiographer	15	1.17%
Pediatrician	15	1.17%
Cuban Volunteer	14	1.09%
Nurse Anesthetist	14	1.09%
Obstetrician/Gynecologist	14	1.09%
Assistant Radiographer	12	0.94%
Anesthesiologist	10	0.78%
Theatre/Operating Room Nurse	11	0.86%

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Post/Position	Total	Percentage
continuation of Table 7...		
Cuban Medical Officer	9	0.70%
Internist	9	0.70%
Lab Technician	9	0.70%
Phlebotomist	9	0.70%
Assistant Pharmacist	8	0.63%
Dentist	8	0.63%
Public Health Nurse	8	0.63%
Surgeon	8	0.63%
Practical Nurse Midwife	7	0.55%
Public Health Officer	7	0.55%
Theatre Technician	6	0.47%
X-ray Technician	6	0.47%
Pharmacy Assistant	5	0.39%
Ward Sister	5	0.39%
Dental Surgeon	4	0.31%
Health Educator	4	0.31%
Microscopist	4	0.31%
Midwife	4	0.31%
Orthopedic Surgeon	4	0.31%
Grand Total	1,279	100.0%

Table 8A: Professional Distribution of Physicians, Nurses and Midwives

Profession	Total	Percentage
PHYSICIANS		
General Practitioners		
General Practitioners/Medical Officers	127	52.70%
Cuban Medical Officers	9	3.73%
Cuban Volunteers	14	5.80%
Others	31	12.86%
General Practitioners Sub-Total	181	75.1%
Specialists		
Pediatricians	15	6.22%
Gynecologists/Obstetricians	14	5.80%
Anesthetists	10	4.15%
Internists	9	3.73%
Surgeons	8	3.32%

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Profession	Total	Percentage
continuation of Table 8A...		
Orthopedic Surgeons	4	1.66%
Specialists Sub-Total	60	24.90%
Physicians Total	241	100.0%
NURSES		
Staff/Registered Nurses	182	38.80%
Rural Health Nurses	65	13.86%
Psychiatric Nurse Practitioners	19	4.05%
Nurse Anesthetists	14	2.99%
Operating Room Nurses	11	2.35%
Public Health Nurses	8	1.71%
Ward Sisters	5	1.07%
Others	24	5.12%
Professional Nurses Sub-Total	328	69.94%
Practical Nurses	141	30.06%
Nurses Total	469	100.0%
MIDWIVES		
Registered Nurse Midwives	28	66.67%
Midwives	4	9.52%
Others	3	7.14%
Professional Midwifes Sub-Total	35	83.33%
Practical Nurse Midwives	7	16.67%
Midwives Total	42	100.0%
Grand Total	752	

Table 8B: Summary of Health Care Providers Groups

Category	Total	Percentage
Nurse	469	36.67%
Medical Doctor	241	18.84%
Community Health Worker	158	12.35%
Medical Technician	126	9.85%
Pharmacist	112	8.76%
Public Health Officer	60	4.69%
Auxiliary Nurse	59	4.61%
Midwife	42	3.28%
Dentist	12	0.94%
Grand Total	1,279	100.0%

Notes:
These nine categories of health care providers are used consistently throughout the report and were selected based on the professional categories identified in relation to achieving the Millennium Development Goals (MDG).

- Nurses include all categories of trained nurses (Practical Nurse, Rural Health Nurse, Registered Nurse, Registered Nurse Midwife, Clinical Nurse Specialist).
- Medical Doctors include general practitioners, medical officers, surgeons, specialists (e.g., anesthesiologists, gynecologists, pediatricians, etc.).
- Community Health Workers include community nurse aide (CNA) and health educators.
- Medical Technicians are trained technicians and include radiographers, assistant radiographers, lab technicians, phlebotomists, theatre technician, x-ray technician.
- Pharmacists are individuals/dispensers who are trained in pharmacy.
- Public Health Officers include environmental assistants, public health inspectors and public health officers.
- Auxiliary nurses do not have any formal training or require any certification. They are not nurses but are nurses' aides.
- Midwifes include all those practical, registered and staff nurses who have training in midwifery. These nurses are not counted as practical, registered and staff nurses.
- Dentists include all dentists and dental surgeons.

Table 9: Terms of Employment of Health Care Providers

Terms of Employment	Total	Percentage
Established	486	38.00%
Board	217	16.97%
Volunteer	171	13.37%
Private Practice	103	8.05%
Contract	83	6.49%
Unestablished	83	6.49%
Volunteer Cuban	44	3.44%
Against Post	9	0.70%
Missing	83	6.49%
Grand Total	1,279	100.0%

Table 10: Total Health Care Providers by Employment Sector (Public/Private)

Public/Private Employer	Total	Percentage
Public	1021	79.83%
Private	258	20.17%
Grand Total	1,279	100.0%

Table 11: Health Care Provider Categories by Employment Sector (Public/Private)

Category	Private	Public	Grand Total	Grand Total Percentage
Nurse	59	410	469	36.67%
Medical Doctor	73	168	241	18.84%
Community Health Worker	-	158	158	12.35%
Medical Technician	56	70	126	9.85%
Pharmacist	52	60	112	8.76%
Public Health Officer	-	60	60	4.69%
Auxiliary Nurse	7	52	59	4.61%
Midwife	8	34	42	3.28%
Dentist	3	9	12	0.94%
Grand Total	258	1,021	1,279	100.0%

Table 12A: Health Care Provider Category by Region/Major Employer

Region/Major Employer	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
Belize	4	26	3	43	56	9	99	47	20	307	24.00%
KHMH	-	1	1	66	16	6	141	13	-	244	19.08%
Orange Walk	22	1	3	28	16	1	60	11	10	152	11.88%
Corozal	7	45	2	33	7	12	17	8	5	136	10.63%
Belmopan	7	17	1	23	7		50	9	6	120	9.38%
Stann Creek	9	18	1	21	5	1	50	11	4	120	9.38%
Toledo	6	39	-	14	5	7	24	6	4	105	8.21%
San Ignacio	4	1	1	10	14	5	27	7	9	78	6.10%
MoH (Belmopan)	-	10	-	3	-	1	1	-	2	17	1.33%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Table 12B: Ratio of Health Care Providers per 10,000 Population by District of Employment*

District	Health Care Provider Category									Grand Total
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer	
Belize (+ KHMH)	0.42	2.81	0.41	11.30	7.08	1.56	25.00	6.25	2.08	57.40
Corozal	1.90	12.23	.54	8.96	1.90	3.26	4.62	2.17	1.36	36.95
Stann Creek	2.70	5.41	.30	6.30	1.50	.30	15.02	3.30	1.20	36.04
Toledo	1.99	12.96	-	4.65	1.66	2.33	7.97	1.99	1.33	34.88
Orange Walk	4.55	0.21	.62	5.79	3.31	0.21	12.42	2.28	2.07	31.47
Cayo	1.43	2.34	.26	4.29	2.73	0.65	10.00	2.08	1.95	25.73
MoH (Belmopan)	-	(10)	-	(3)	-	(1)	(1)	-	(2)	(17)
Grand Total	1.83	4.91	0.37	7.48	3.79	1.30	14.56	3.48	1.86	39.71

Note:
*Physician category includes 60 Medical Specialists and 181 General Practitioners; the Midwife category includes 35 midwives and 7 Practical Nurse Midwives; and, the Nurse category includes 328 Professional and Baccalaureate Nurses plus 141 Practical Nurses, for a total of 23.3 health professionals per 10,000 population. If practical nurses and practical nurse midwives are excluded—to be consistent with the professional definitions suggested in the Regional Goals Handbook—the density of health professionals per 10,000 population is reduced to 18.8. The total population estimate used for Belize in these calculations was 322,100.

Table 13: Category of Health Care Provider by Age Group

Age	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
< 20	1				1		1	3	1	7	0.55%
20 - 24		1			16		30	13	10	70	5.47%
25 - 29	7	8	1	16	19		54	16	13	134	10.48%
30 - 34	7	10	1	26	14	7	91	14	5	175	13.68%
35 - 39	8	12	2	34	15	9	84	9	7	180	14.07%
40 - 44	12	16	1	35	17	8	74	4	10	177	13.84%
45 - 49	7	21	4	26	8	6	59	2	11	144	11.26%
50 - 54	13	21	1	6	6	5	37	2	2	93	7.27%
55 - 59	4	13	1	5	3	5	13	1		45	3.52%

Age	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
continues on next page...											
continuation of Table 13...											
60 - 64		7		5			5			17	1.33%
> 65		10		1			3			14	1.09%
Missing		39	1	87	27	2	18	48	1	223	17.44%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Table 14: Category of Health Care Provider by Gender

Sex	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
Female	54	117	4	83	48	42	441	68	17	874	54%
Male	5	41	8	158	78	-	28	44	43	405	5%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Table 15: Category of Health Care Provider by Employment Post/Position

Post/Position	Health Care Provider Category									Grand Total
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer	
Staff/Registered Nurse							182			182
Practical Nurse							141			141
Community Nurse Aide		140								140
GenPract./Medical Officer				127						127
Others		14		31	19	3	24	3	2	96
Pharmacist								79		79
Rural Health Nurse							65			65
continues on next page...										

Post/Position	Health Care Provider Category									Grand Total
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer	
continuation of Table 15...										
Auxiliary Nurse	59									59
Medical Technician					46					46
Staff/Reg. Nurse Midwife						28				28
Public Health Inspector									27	27
Environmental Assistant									24	24
Psychiatric Nurse Practitioner							19			19
Dispenser								17		17
Radiographer					15					15
Pediatrician				15						15
Cuban Volunteer				14						14
Nurse Anesthetist							14			14
Obstetrics/Gynecologist				14						14
Assistant Radiographer					12					12
Anesthesiologist				10						10
Operating Room Nurse							11			11
Cuban Medical Officer				9						9
Internist				9						9
Lab Technician					9					9
Phlebotomist					9					9
Assistant Pharmacist								8		8
Dentist			8							8
Public Health Nurse							8			8
Surgeon				8						8
Practical Nurse Midwife						7				7
Public Health Officer									7	7
Theatre Technician					6					6
X-ray Technician					6					6
Pharmacy Assistant								5		5
Ward Sister							5			5
Dental Surgeon			4							4

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Post/Position	Health Care Provider Category									Grand Total
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer	
continuation of Table 15...										
Health Educator		4								4
Microscopist					4					4
Midwife						4				4
Orthopedic Surgeon				4						4
Grand Total	59	158	12	241	126	42	469	112	60	1,279

Notes:
The posts/positions indicate current job titles. The titles are in some cases overlapping, general and outdated, however they are consistent with current health care provider workplace position listings.

- Registered nurse/midwife is a registered nurse who has received training in midwifery after becoming a registered nurse and now functions in the post of registered nurse/midwife.
- A rural health nurse is a nurse who successfully completed a one year rural health nurse program at the University of Belize. This nurse is not a registered nurse.
- A staff nurse is a registered nurse and a staff nurse/midwife is the same as a registered nurse/midwife.
- A practical nurse is a nurse who successfully completed an eighteen month nursing program at the University of Belize. This nurse is not a registered nurse.
- A psychiatric nurse practitioner is a registered nurse who has received training in psychiatry after becoming a registered nurse.
- CNA (Community Nurse Aide) is a individual who has only no formal health care training or any certification. CNAs assist the community in which they live with referrals, first aid, administering of injections, etc.
- Auxiliary nurses do not have any formal training or require any certification.
- Operating room nurse is a registered nurse who has received training in operating room nursing science after becoming a registered nurse.
- Nurse Anesthetist is a registered nurse who has received training in nurse anesthesiology after becoming a registered nurse.
- Surgeons include all type of surgeons. Those who said they were orthopedic surgeons were kept in a group to have more specific information. The dental surgeons were grouped with dentists.

Table 16: Category of Health Care Provider by Terms of Employment

Terms of Employment	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
Established	42	10	8	48	56	20	235	31	36	486	38.00%
Board		1		56	15	6	126	13		217	16.97%
Volunteer		140		13	1	2	15			171	13.37%
Private Practice			3	40	17			43		103	8.05%
Contract	2	3		18	2	8	43	7		83	6.49%
Unestablished	13	3	1	1	8	1	27	6	23	83	6.49%
Volunteer Cuban				34	3		6	1		44	3.44%
Against Post	1	1		1	2	1	3			9	0.70%
Missing	1			30	22	4	14	11	1	83	6.49%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Notes:
Unestablished is a short term-term (six months to two years) contract worker without a permanent post.
There are two groups of volunteers, those from Belize and those from other countries. Cuban volunteers are kept as a separate group because a large number of volunteers come from that country. Volunteers come from other countries as well, such as Nigeria. The other group of volunteers within Belize are the local community nurse aides (CNAs) who are not paid but receive a monthly stipend of $100.
The Karl Heusner Memorial Hospital (KHMH) is run by a Board of Directors and all the workers at the hospital are accountable to the Board.

Table 17: Category of Health Care Provider Workers by Employment Sector (Public / Private)

Employment Sector	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
Public	52	158	9	168	70	34	410	60	60	1,021	79.83%
Private	7		3	73	56	8	59	52		258	20.17%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Table 18: Category of Health Care Provider by Urban-Rural Location

Disctrict Location Urban/Rural	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
Corozal											
Corozal Town	7		2	30	7	12	17	8	5	88	6.88%
Corozal Rural		45		3						48	3.75%
Orange Walk											
Orange Walk Town	22	1	3	28	16	1	60	11	10	152	11.88%
Belize											
Belize City	4	5	4	108	72	15	240	60	20	528	41.28%
Belize Rural		22		1						23	1.80%
Cayo											
Belmopan	7	12	1	25	7	1	48	8	7	116	9.07%
Benque				1			2	1	2	6	0.47%
San Ignacio	4	1	1	10	14	5	27	7	8	77	6.02%
Cayo Rural		15					1			16	1.25%
Stann Creek											
Dangriga	7	2	1	16	5	1	43	8	4	87	6.80%
Stan Creek Rural	2	16		5			7	3		33	2.58%
Toledo											
Punta Gorda	6			8	5	6	18	4	4	51	3.99%
Toledo Rural		39		6		1	6	2		54	4.22%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Table 19: Nurse and Midwife Graduates, 2003 to 2007, by District of Residence Upon Applying to the University of Belize and Current District/Place of Employment

Current Area of Employment	District of Residence of Nursing & Midwife when Applied to UB					Grand Total	Grand Total Percentage
	Belize	Cayo	Corozal	Orange Walk	Toledo		
KHMH	15				1	16	40.0%
Belize	5	1			1	7	17.5%
Orange Walk	1	1	1	3		6	15.0%
Belmopan		3				3	7.5%
San Ignacio	1	2				3	7.5%
Corozal			2			2	5.0%
Toledo					2	2	5.0%
MOH	1					1	2.5%
Stann Creek							0.0%
Grand Total	23	7	3	3	4	40	100.0%

Note:
Sample includes the 79 professional nurse and midwives that graduated between 2003 and 2007.

Table 20: Program Completion Rates of University of Belize Students Enrolled in Health Programs, 2001 to 2005

Program	2001		2002		2003		2004		2005		Total		Completion Rate Percentage
	Enrolled	Graduated	Enrolled	Graduated	Enrolled	Graduated	Enrolled	Graduated	Enrolled	Graduated	Enrolled	Graduated	
Midwifery	15	8	1	0					25	16	41	24	58.54%
Social Work (Bachelor)	9	3	6	2	7	6	3	2	3	3	28	16	57.14%
Practical Nursing	20	7	11	8	24	9	13	2	24	7	92	33	35.87%
Nursing	21	7	13	4	21	11	32	13	44	10	131	45	34.35%
Medical Laboratory Technology	4	0	6	3	12	5	12	5	16	4	50	17	34.00%
Pharmacy	18	2	6	2	7	4	11	5	28	10	70	23	32.86%
Social Work (Associate)	27	5	23	3	22	8	16	3	27	3	115	22	19.13%

Note:
"Graduated" reflects the number of students who completed the requirements for their program within the length of the program. The data is only for those who are accepted in the first semester of the academic year.

Table 21: Duration of Employment of Health Care Providers

Duration of Employment (Years)	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
2	2	1	1	14	8	6	58	7	6	103	8.05%
3	4	3	2	18	4		43	5	9	88	6.88%
4	3	1		7	2	2	34	1	2	52	4.07%
5		1		10	3	2	19	4		39	3.05%
6	1	4		9	8		25	2	7	56	4.38%
7		1	1	6	2	2	23	6	2	43	3.36%
8	2	16		4	5	1	20	2	2	52	4.07%
9	4	2		1	3		31	1		42	3.28%
10	7	35	1	5	2	1	11	2		64	5.00%
11		2	1	2	1		5	2		13	1.02%
12		3		4	1	1	7			16	1.25%
13							4			4	0.31%
14	1	3		4			2	1		11	0.86%
15	3	25		3	2		12			45	3.52%
16	2	2	1	1	1	2	8		2	19	1.49%
17				4	2		4	1		11	0.86%
18		12		3			11		5	31	2.42%
19		2			3	2	10	1	3	21	1.64%
20		9					1	2	3	15	1.17%
21	1	1					5		1	8	0.63%
22		4			1		4			9	0.70%
23	3			1	2	1	3		3	13	1.02%
24	1		1				2		1	5	0.39%
25									1	1	0.08%
26	1				2		2			5	0.39%
27							3			3	0.23%
28	3			1						4	0.31%
29	3								1	4	0.31%
30							3			3	0.23%
31							1		2	3	0.23%
32					1					1	0.08%
33			1				1			2	0.16%

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Duration of Employment (Years)	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
continuation of Table 21...											
37							1			1	0.08%
Missing	18	31	3	144	73	22	116	75	10	492	38.47%
Grand Total	59	158	12	241	126	42	469	112	60	1,279	100.0%

Note:
The average number of years worked is 9.50, with a range of 2 to 37 years with a standard deviation of 6.97 years.

Appendix C
Health Education Programs, University of Belize 2000 to 2009[8]

Table 1: Total Health Program Graduates by Year

Year	Number	Percentage
2000	23	4.4%
2001	43	8.1%
2002	63	11.9%
2003	44	8.3%
2004	54	10.2%
2005	56	10.6%
2006	41	7.8%
2007	59	11.2%
2008	72	13.6%
2009	73	13.8%
Total	528	100.0%

Table 2: Total Health Program Graduates by Gender

Gender	Number	Percentage
Female	435	82.4%
Male	93	17.6%
Total	528	100.0%

Table 3: Total Health Program Graduates by Ethnicity

Ethnicity	Number	Percentage
Creole	215	40.72%
Mestizo	130	24.62%
Garifuna	72	13.64%
East Indian	36	6.82%
Others	23	4.36%
Mayan	16	3.03%
Nigerian	15	2.84%

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8. Unless otherwise specified, all health education data refers to the total number of health program graduates (528) from the University of Belize between 2000 and 2009.

Ethnicity	Number	Percentage
continuation of Table 3...		
Oriental	13	2.46%
Ketchi Mayan	3	0.57%
Mennonite	3	0.57%
Caucasian	2	0.38%
Total	528	100.0%

Table 4: Total Health Graduates by Language Spoken

Language	Frequency	Percentage
English	261	49.43%
English/Spanish	129	24.43%
English/Garifuna	72	13.64%
English/Mayan	16	3.03%
English/Others	16	3.03%
English/Nigerian	15	2.84%
English/Mandarin	13	2.46%
English/German	3	0.57%
English/Ketchi	3	0.57%
Total	528	100.0%

Table 5: Total Health Graduates by Major and Type of Degree Granted

Major	Type of Degree Granted				Percentage
	Associate	Bachelor	Certificate	Diploma	
Social Work	83	38			22.92%
Pharmacy	79				14.96%
Nursing		78			14.77%
Professional Nursing				64	12.12%
Midwifery			58		10.98%
Practical Nursing			58		10.98%
Medical Laboratory Technology	51				9.66%
Psychiatric Nurse Practitioner			13		2.46%
Environmental Health	6				1.14%
Total	219	116	129	64	100.0%

Table 6: Total number of Health Graduates by Category

Category	Frequency	Percentage
Others	178	33.71%
Pharmacist	79	14.96%
Nurse	78	14.77%
Professional Nursing	64	12.12%
Practical Nursing	58	10.98%
Midwife	58	10.98%
Psychiatric Nurse Practitioner	13	2.46%
Total	528	100.0%

Note:
Psychiatric nurse practitioners are counted as nurses.

Table 7: Total number of Health Graduates by Degree

Degree	Frequency	Percentage
Associate	219	41.5%
Certificate	129	24.0%
Bachelor	116	22.0%
Diploma	64	12.1%
Total	528	100.0%

Note:
An associate degree program typical requires approximately 72 credit hours and take two years to complete. A bachelor degree program typically requires approximately 120 credit hours and take four years to complete. A certificate program is a program at a lower level than the associate degree and typically takes a year to complete. The diploma program was a three year program after which a nurse sat the nurse examination board exam to become a registered nurse. The diploma program was replaced by the bachelor in nursing program in 2000.

Table 8: Total number of Health Graduates by District

District	Number	Percentage
Belize	273	51.7%
Cayo	115	21.8%
Corozal	43	8.1%
Orange Walk	36	6.8%
Stann Creek	26	4.9%
Toledo	24	4.5%
Not known or not applicable	11	2.1%
Total	528	100.0%

Table 9: Total number of Health Graduates by City

City	Number	Percentage
Belize	216	40.9%
Villages	104	19.7%
Belmopan	48	9.1%
City not stated or not applicable	42	8.0%
Orange Walk	28	5.3%
Dangriga	20	3.8%
San Ignacio	19	3.6%
Corozal	18	3.4%
Punta Gorda	18	3.4%
Santa Elena	9	1.7%
Benque Viejo	5	0.9%
San Pedro	1	0.2%
Total	528	100.0%

Table 10: Total Number of Graduates by Degree Type and District

District	Type of Degree Granted				Total
	Associate	Bachelor	Certificate	Diploma	
Belize	105	68	63	37	273
Cayo	45	28	27	15	115
Corozal	24	6	9	4	43
Orange Walk	21	3	10	2	36
Stann Creek	15	3	6	2	26
Toledo	6	7	11		24
Missing	3	1	3	4	11
Total	219	116	129	64	528

Table 11: Total Number of Health Graduates per Year by Profession

Major	Year										Grand Total
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Social Work	12	6	5	11	16	17	13	13	13	15	121
Pharmacy	5	13	5	9	2	3	10	4	19	9	79
Nursing					11	10	5	14	26	12	78
Professional Nursing		21	22	2	16			2	1		64
Midwifery			26	12				9	6	5	58

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Major	Year										Grand Total
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
continuation of Table 11...											
Practical Nursing		1		3	8	13	5	11	2	15	58
Medical Laboratory Technology	6	2	5	7	1	3	6	5	5	11	51
Psychiatric Nurse Practitioner						10	2	1			13
Environmental Health										6	6
Total	23	43	63	44	54	56	41	59	72	73	528

Table 12: Total Number of Applicants to Health Programs by Major, Year and District/Country

Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
2000										
Nursing	95	39	10	5	2	4				155
Social Work	96	12	2		2					112
Pharmacy	30	19	15	8	5	6				83
Midwifery	24	14	12	7	3	2				62
Medical Laboratory Technology	16	7	12	14	3					52
Practical Nursing	11									11
Professional Nursing	3				3					6
Psychiatric Nurse Practitioner		3								3
2000 Total	275	94	51	34	18	12				484
2001										
Social Work	131	31	3	2		4				171
Nursing	74	25	10	6		9				124
Pharmacy	24	15	15	8	14	3				79
Practical Nursing	54				1					55
Medical Laboratory Technology	15	9	9	13	2					48
Midwifery	22	3		7		3				35

continues on next page...

Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
continuation of Table 12...										
Professional Nursing	2				2					4
Psychiatric Nurse Practitioner		3								3
2001 Total	322	86	37	36	19	19				519
2002										
Social Work	166	44	6	6	9	9				240
Nursing	83	17	7	15		12				134
Pharmacy	42	9	13	8	9	3				84
Medical Laboratory Technology	27	6	8	7	5	5				58
Practical Nursing	32	14			2	1				49
Midwifery	7	2	1	2	2					14
2002 Total	357	92	35	38	27	30				579
2003										
Social Work	176	36	7	3	11	10				243
Nursing	127	25	6	15	7	8				188
Practical Nursing	78	16	4		1	8				107
Pharmacy	33	26	8	8	5					80
Medical Laboratory Technology	42	10	16	2	2	2				74
Psychiatric Nurse Practitioner	8	17	3	11	3	3				45
2003 Total	464	130	44	39	29	31				737
2004										
Nursing	156	47	11	14	4	21				253
Social Work	144	28	8	1	10	8				199
Pharmacy	56	25	12	7	3	7				110
Medical Laboratory Technology	25	22	13	9	11	6				86
Practical Nursing	42	20		1		7				70
Psychiatric Nurse Practitioner	4	3	1	3	1	1				13
Midwifery		1								1
2004 Total	427	146	45	35	29	50				732

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Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
continuation of Table 12...										
2005										
Nursing	150	58	5	11	19	19	2	1	1	266
Social Work	135	26	3	1	7	2				174
Pharmacy	52	40	16	16	7	14			3	148
Midwifery	42	14	8	12	12	9				97
Medical Laboratory Technology	21	34	10	11	4	4			5	89
Practical Nursing	47	15	1		15	7			3	88
Psychiatric Nurse Practitioner		1								1
2005 Total	447	188	43	51	64	55	2	1	12	863
2006										
Nursing	170	85	23	25	16	28			7	354
Social Work	155	34	2	2	7	2	1		1	204
Pharmacy	58	22	16	20	5	2	2		7	132
Medical Laboratory Technology	23	47	10	4	5	5			3	97
Practical Nursing	50	10	5	7	9	11		1		93
Midwifery	9	4	2	2	3	2				22
Rural Health Nursing	3									3
2006 Total	468	202	58	60	45	50	3	1	18	905
2007										
Nursing	155	87	29	13	21	28			3	336
Social Work	168	31	2	3	9	2				215
Pharmacy	68	42	10	12	19	7			5	163
Practical Nursing	73	38	1	2	20	20			4	158
Medical Laboratory Technology	23	38	26	3	8	6			11	115
Rural Health Nursing	24	13	1		3	3				44
2007 Total	511	249	69	33	80	66			23	1031
2008										
Nursing	206	117	44	36	48	39	2			492
Social Work	226	37	1	13	2	12				291

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Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
continuation of Table 12...										
Pharmacy	76	70	14	14	22	9			2	207
Practical Nursing	46	68	4	7	12	23	2		1	163
Medical Laboratory Technology	24	53	18	8	10	5			8	126
Public Health Nursing	21	40		5	5	5				76
Rural Health Nursing	23	6	1		4	5			1	40
Midwifery	2									2
2008 Total	624	391	82	83	103	98	4		12	1,397
Grand Total	3,895	1,578	464	409	414	411	9	2	65	7,247

Notes:
More details of these programs can be obtained from the University of Belize at *http://www.ub.edu.bz*.
Program Description:

- Nursing Programs:
  - **Nursing Program** is a four-year bachelor degree program. This program replaced the professional nursing diploma program in 2000.
  - **Practical Nursing Program** is an eighteen-month certificate program.
  - **Rural Health Nursing Program** is a three-year certificate program.
  - **Psychiatric Nurse Practitioner Program** is an eighteen-month certificate program. Students must be a registered nurse or have a bachelor degree to take this program.
  - **Midwifery** is an eighteen-month certificate program.
  - **Public Health Nursing** is a four-year bachelor degree program.
- **Medical Laboratory Technology** is a three-year associate program.
- **Pharmacy** is a three-year associate program.
- There are two **Social Work Programs**. One is a three-year associate degree program and the other is a two-year bachelor degree program which is a continuation of the associate degree.

Table 13: Total Number of Admissions to Health Programs by Major, Year and District/Country

Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
2000										
Nursing	95	39	10	5	2	4				155
Social Work	96	12	2		2					112
Pharmacy	30	19	15	8	5	6				83
Midwifery	24	14	12	7	3	2				62
Medical Laboratory Technology	16	7	12	14	3					52
Practical Nursing	11									11
Professional Nursing	3				3					6
Psychiatric Nurse Practitioner		3								3
2000 Total	275	94	51	34	18	12				484
2001										
Nursing	74	25	10	6		9				124
Pharmacy	24	15	15	8	14	3				79
Practical Nursing	54				1					55
Medical Laboratory Technology	15	9	9	13	2					48
Midwifery	22	3		7		3				35
Professional Nursing	2				2					4
Psychiatric Nurse Practitioner		3								3
Social Work	131	31	3	2		4				171
2001 Total	322	86	37	36	19	19				519
2002										
Social Work	138	39	6	5	6	8				202
Nursing	75	15	6	13		10				119
Pharmacy	36	9	11	6	9	2				73
Medical Laboratory Technology	23	5	8	5	4	4				49
Practical Nursing	24	11			2	1				38
Midwifery	2									2
2002 Total	298	79	31	29	21	25				483

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Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
continuation of Table 13...										
2003										
Social Work	134	30	6	2	9	9				190
Nursing	103	21	6	11	5	8				154
Practical Nursing	62	13	2			6				83
Pharmacy	27	21	8	6	5					67
Medical Laboratory Technology	33	8	11	1	2	2				57
Psychiatric Nurse Practitioner	4	11	2	8	2	2				29
2003 Total	363	104	35	28	23	27				580
2004										
Nursing	131	38	9	11	2	17				208
Social Work	121	26	7	1	9	4				168
Pharmacy	47	22	11	6	2	5				93
Medical Laboratory Technology	23	19	11	6	9	5				73
Practical Nursing	32	14				7				53
Psychiatric Nurse Practitioner	4	3	1	3	1	1				13
Midwifery										
2004 Total	358	122	39	27	23	39				608
2005										
Nursing	129	51	4	9	15	16			1	225
Social Work	116	22	3		7	1				149
Pharmacy	49	37	15	13	5	9			3	131
Midwifery	31	11	6	8	9	7				72
Medical Laboratory Technology	16	26	9	7	4	4			4	70
Practical Nursing	36	12			11	5			2	66
Psychiatric Nurse Practitioner		1								1
2005 Total	377	160	37	37	51	42			10	714
2006										
Nursing	149	70	19	20	13	22			5	298
Social Work	127	29	2	1	7	1				167
Pharmacy	50	20	16	18	5	2			6	117

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Year/ Program	District/Country									Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Nigeria	Others	Null	
continuation of Table 13...										
Medical Laboratory Technology	20	39	8	4	5	5			3	84
Practical Nursing	39	7	3	5	8	8				70
Midwifery	9	4	2	2	3	2				22
Rural Health Nursing	3									3
2006 Total	397	169	50	50	41	40			14	761
2007										
Nursing	147	77	23	11	19	26			2	305
Social Work	149	29	2	2	7	2				191
Pharmacy	60	34	9	12	17	6			5	143
Practical Nursing	58	28	1	2	14	15			3	121
Medical Laboratory Technology	21	34	22	3	7	5			9	101
Rural Health Nursing	20	8			3	3				34
2007 Total	455	210	57	30	67	57			19	895
2008										
Nursing	174	100	37	29	36	31				407
Social Work	194	30	1	10	2	9				246
Pharmacy	66	58	12	12	20	8			2	178
Practical Nursing	33	54	3	5	7	17			1	120
Medical Laboratory Technology	20	47	17	6	9	4			8	111
Public Health Nursing	15	32		4	4	4				59
Rural Health Nursing	22	6	1		4	5			1	39
Midwifery	2									2
2008 Total	526	327	71	66	82	78			12	1,162
Grand Total	3,371	1,351	408	337	345	339			55	6,206

Note:
Admission mean that a student entered/enrolled at the University of Belize.

Table 14: Number of Students Admitted to the University of Belize and Registered by Major and Year

Year/Status	Programs										Grand Total
	Medical Laboratory Technician	Midwifery	Nursing	Pharmacy	Practical Nursing	Professional Nursing	Psychiatric Nurse Practitioner	Public Health Nursing	Rural Health Nursing	Social Work	
2000											
pgRegistered	52	62	155	83	11	6	3			112	484
2000 Total	52	62	155	83	11	6	3			112	484
2001											
pgRegistered	48	35	124	79	55	4	3			171	519
2001 Total	48	35	124	79	55	4	3			171	519
2002											
Accepted	9	12	15	11	11					38	96
accRegistered	6	1	8	7	9					25	56
pgRegistered	43	1	111	66	29					177	427
2002 Total	58	14	134	84	49					240	579
2003											
Accepted	17		34	13	24		16			53	157
accRegistered	11		20	7	19		13			29	99
pgRegistered	46		134	60	64		16			161	481
2003 Total	74		188	80	107		45			243	737
2004											
Accepted	13	1	45	17	17					31	124
accRegistered	11		27	11	11					18	78
pgRegistered	62		181	82	42		13			150	530
2004 Total	86	1	253	110	70		13			199	732
2005											
Accepted	19	25	41	17	22					25	149
accRegistered	11	23	23	13	13					14	97
pgRegistered	59	49	202	118	53		1			135	617
2005 Total	89	97	266	148	88		1			174	863
2006											
Accepted	13		56	15	23					37	144
accRegistered	11		33	7	15					20	86

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Year/Status	Programs										Grand Total
	Medical Laboratory Technician	Midwifery	Nursing	Pharmacy	Practical Nursing	Professional Nursing	Psychiatric Nurse Practitioner	Public Health Nursing	Rural Health Nursing	Social Work	
continuation of Table 14...											
pgRegistered	73	22	265	110	55				3	147	675
2006 Total	97	22	354	132	93				3	204	905
2007											
Accepted	14		31	20	37				10	24	136
accRegistered	14		17	16	30				5	17	99
pgRegistered	87		288	127	91				29	174	796
2007 Total	115		336	163	158				44	215	1031
2008											
Accepted	15		85	29	43			17	1	45	235
accRegistered	11		60	24	28			15		32	170
pgRegistered	100	2	347	154	92			44	39	214	992
2008 Total	126	2	492	207	163			76	40	291	1,397
Grand Total	745	233	2,302	1,086	794	10	65	76	87	1,849	7,247

Notes:
pgRegistrered = Total Registered students for a given semester; accRegistered = Accepted Students who registered for a given semester; Accepted = Total Accepted Students for a given semester.

Table 15: Number of Health Program Graduates by Major, Year and District

Year Graduated/ Major	District							Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Missing	
2000								
Social Work	6	4		2				12
Medical Laboratory Technician	3		3					6
Pharmacy	1		2	2				5
2000 Total	10	4	5	4				23
2001								
Professional Nursing	10	5	1	1			4	21

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Year Graduated/ Major	District							Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Missing	
continuation of Table 15...								
Pharmacy	7	2	1	1		2		13
Social Work	3	2			1			6
Medical Laboratory Technician	1			1				2
Practical Nursing							1	1
2001 Total	21	9	2	3	1	2	5	43
2002								
Midwifery	11	6	5	2	1	1		26
Professional Nursing	16	3	1	1	1			22
Medical Laboratory Technician	1	1		2	1			5
Pharmacy	1	1	1	1	1			5
Social Work	4	1						5
2002 Total	33	12	7	6	4	1		63
2003								
Midwifery	7	1		3		1		12
Social Work	10	1						11
Pharmacy	3	1	2	1	1	1		9
Medical Laboratory Technician	1		4	2				7
Practical Nursing	3							3
Professional Nursing	2							2
2003 Total	26	3	6	6	1	2		44
2004								
Professional Nursing	7	6	2		1			16
Social Work	10	3	1	1		1		16
Nursing	5	2	1	1		2		11
Practical Nursing	5	3						8
Pharmacy	1				1			2
Medical Laboratory Technician	1							1
2004 Total	29	14	4	2	2	3		54
2005								
Social Work	11	3	1		1	1		17
Practical Nursing	10	2				1		13

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Year Graduated/ Major	District							Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Missing	
continuation of Table 15...								
Nursing	5		2	1		2		10
Psychiatric Nurse Practitioner	3	3	1	3				10
Medical Laboratory Technician	1				2			3
Pharmacy	3							3
2005 Total	33	8	4	4	3	4		56
2006								
Social Work	9	3	1					13
Pharmacy	2	5	1	1	1			10
Medical Laboratory Technician	2	1	3					6
Nursing	3	1		1				5
Practical Nursing	3					2		5
Psychiatric Nurse Practitioner					1	1		2
2006 Total	19	10	5	2	2	3		41
2007								
Nursing	11	3						14
Social Work	9	2			2			13
Practical Nursing	5	3			2	1		11
Midwifery	5		2	1		1		9
Medical Laboratory Technician		3			1	1		5
Pharmacy	1		2	1				4
Professional Nursing	1	1						2
Psychiatric Nurse Practitioner		1						1
2007 Total	455	210	57	30	67	57		895
2008								
Nursing	14	7	1			3	1	26
Pharmacy	7	6	2	3	1			19
Social Work	9	2			2			13
Midwifery	3	2			1			6
Medical Laboratory Technician	2	2		1				5
Practical Nursing	2							2
Professional Nursing	1							1
2008 Total	38	19	3	4	4	3	1	72

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Year Graduated/ Major	District							Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Missing	
continuation of Table 15...								
2009								
Practical Nursing	6	4	1			2	2	15
Social Work	10	1	1				3	15
Nursing	3	8			1			12
Medical Laboratory Technician	4	5	1		1			11
Pharmacy	6	1		1	1			9
Environmental Health	3	2		1				6
Midwifery		2		1	1	1		5
2009 Total	32	23	3	3	4	3	5	73
Grand Total	273	115	43	36	26	24	11	528

Table 16: Health Program Graduates by Age, Gender and Program Major

Gender/Age Group	Program Major									Grand Total
	Environmental health	Medical Laboratory Technician	Midwifery	Nursing	Pharmacy	Practical Nursing	Professional Nursing	Psychiatric Nurse Practitioner	Social Work	
Female										
< 20					2	4				6
20 - 24		10		19	16	17			13	75
25 - 29	3	11	3	29	17	13	8	2	19	105
30 - 34		4	21	13	12	10	31	7	17	115
35 - 39	1		14	5	3	7	8	2	17	57
40 - 49			11	3	2		5	1	17	39
50 - 54			4	1		2	8	1	7	23
55 - 59		1	3			1	2		5	12
60 - 64									3	3
Total	4	26	56	70	52	54	62	13	98	435
Male										
20 - 24		12		2	8				3	25

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Gender/Age Group	Program Major									Grand Total
	Environmental health	Medical Laboratory Technician	Midwifery	Nursing	Pharmacy	Practical Nursing	Professional Nursing	Psychiatric Nurse Practitioner	Social Work	
continuation of Table 16...										
25 - 29		7		4	7	1	1		7	27
30 - 34		5	1	1	6	1	1		4	19
35 - 39	1	1	1	1	3				3	10
40 - 49	1				2	1			3	7
50 - 54						1			1	2
55 - 59					1				2	3
Total	2	25	2	8	27	4	2		23	93
Grand Total	6	51	58	78	79	58	64	13	121	528

Table 17: Age and Gender of Health Program Graduates by Year

Gender/Age Group	Year										Grand Total
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Female											
< 20									1	5	6
20 - 24					4	10	8	18	14	21	75
25 - 29	1	7	5	12	15	15	9	12	16	13	105
30 - 34	5	19	28	2	6	13	1	16	14	11	115
35 - 39	4	5	11	5	10	7	5	2	5	3	57
40 - 49	1	3	7	13	2	2	3	1	5	2	39
50 - 54	3	3	3	2	7	2		1	1	1	23
55 - 59	2	1	3	1	2	1		2			12
60 - 64	1		1			1					3
Total	17	38	58	35	46	51	26	52	56	56	435
Male											
20 - 24							8	3	8	6	25
25 - 29			2	4	4	2	1	3	6	5	27
30 - 34	3	5	1	4	3				1	2	19
35 - 39	2		2		1	1	2			2	10
40 - 49						2	2	1		2	7

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Gender/Age Group	Year										Grand Total
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
continuation of Table 17...											
50 - 54				1					1		2
55 - 59	1						2				3
Total	6	5	5	9	8	5	15	7	16	17	93
Grand Total	23	43	63	44	54	56	41	59	72	73	528

Table 18: Total Number of Nursing Graduates to Pass Certification Exams by Year

Exam Results	Year										Grand Total
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
Passed	11	17	20	8	8	9			9	14	96
Referred	7	13	8	2	1	2	2	11	8	2	56
Failed	1	-	9	3	3	-	1	4	20	-	38
Total	19	30	37	10	12	11	3	15	37	16	190

Note:
117 graduates sat the registered nurse examination between 2000 and 2009 and took an average of 1.62 times to pass the examination.

Table 19: Total Number of Nursing Graduates to Pass Certification Exams by District

Nurse Exam Results	District							Grand Total
	Belize	Cayo	Corozal	Orange Walk	Stann Creek	Toledo	Missing	
Passed	56	24	6	4	2	5	3	100
Referred	40	10	3	1		1	1	56
Failed	31	7	1					38
Total	127	41	9	5	2	6	4	194

Table 20: Total Number of Students Who Received Scholarships by Program

Major	Yes	No	NA	Grand Total
Social Work	68	53		121
Pharmacy	38	41		79
Nursing	47	31		78
Professional Nursing	22	36	6	64
Midwifery	25	33		58

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Major	Yes	No	NA	Grand Total
continuation of Table 20...				
Practical Nursing	21	36	1	58
Medical Laboratory Technology	24	27		51
Psychiatric Nurse Practitioner	12	1		13
Environmental Health	3	3		6
Grand Total	260	261	7	528

Table 21: Total Number of Students Who Received Scholarships by District

District	Yes	No	NA	Grand Total
Belize	134	136	3	273
Cayo	66	49		115
Corozal	15	28		43
Orange Walk	17	19		36
Stann Creek	15	11		26
Toledo	10	14		24
Null	3	4	4	11
Grand Total	260	261	7	528

APPENDIX D
MAP OF BELIZE

APPENDIX E
PRESENTATION OF FINDINGS
OBSERVATORY MEETING, NOVEMBER 2009

Human Resources for Health in Belize

A Status Report on the Human Resources for Health Core Data Set Project

November 10, 2009

Context and Rationale
Belize

- Government of Belize Health Sector Reform Program (2007-2011)
- Belize National Health Insurance Scheme
- Belize Health Information System
- HRH Reform
  - Improving HRH distribution
  - Managing migration
  - Developing an HRH data base
  - HRH monitoring & evaluation guidelines
  - Strengthening MoH HRH planning capacity

Project Objectives
HRH Core Data Set

- Complete the collection and analysis and report on the Core Data Set project launched in 2008
- Identify HRH stocks, education, management and regulation
- Highlighting major concerns & issues

Project Team

Internal

- PAHO/WHO Belize
- Belize Ministry of Health (PAPU)
- University of Belize

External

- PAHO/WHO, Washington, D.C.
- Cameron Health Strategies Group

Human Resources for Health Goal

To increase efficiency, quality and equity of the health services delivered, through a well trained, well compensated, and well distributed workforce that has the capacity to meet the needs of presented and that is committed to the mission enough to be motivated to give the very best. —PAHO/WHO

Context and Rationale Regional

- Toronto Call to Action - 2005
- Health Agenda for the Americas - 2008-2015
- Task Force of the Regional Network of Observatories for HRH, Baseline Values

Approach

- Introductory Team Meeting, June, 2009
- Identified data required and sources available
- Began update of 2008 survey of MoH personnel data
- Identified top 10 most relevant data fields
- Meetings with MoH staff, University, KHMH, clinics and Health Regions re HRH public & private data collection & availability
- Surveyed MoH staff on HRH policy and regulatory issues
- Collected all graduate data from the Faculty of Nursing, Allied Health and Social Work at the University of Belize, 2000-2009
- Cross-compared employment and graduate data
- Developed a strategy to address HRH issues identified

HRH Data Fields

Total Health Care Providers in MoH, Hospitals, Clinics & Regions, Public & Private by:

- Name
- District (Urban/Rural)
- Gender
- Age
- Ethnicity and Language
- Profession and Employment Post
- Terms of Employment
- Start Date of Current Employment

University of Belize Graduate Data

Total Health Program Graduates by:

- Year (2000 to 2009)
- Gender
- Ethnicity and Language
- Type of Degree Granted
- Training Program
- District and City (on application)
- Certificate Passes (Nurses)
- Scholarship recipients
- Plus total student applicants, accepted and admissions by program, year and district

Health Workforce in Belize Historical

Supply

- Belize 40th place in HRH density in the Region of the Americas in the 1990's; 29th place by year 2000
- In 2005, 3rd lowest density of physicians in Region but in 9th place overall in the supply of nurses
- Belize research minimum population density target of 25 per 10,000 (WHO) in 2005, but has recently fallen below 20

Demand

- 38,000 physicians, nurses and midwives needed in Region
- 4.3 million health care workers needed world wide (WHO)
- Population growth nearing 4 percent annually, 6 percent in Cayo and Belize Districts, increasing service demands

Human Resources for Health 2005 and 2009

Category	2005	2009	Percentage Change
General Practitioners	166%	181%	9.0%
Specialists	159%	60%	-62.3%
MD Volunteers	63%	34%	-46.0%
Registered Nurses	321%	328%	2.2%
Public Health Nurses	12%	8%	-33.3%
Rural Health Nurses	52%	65%	25.0%
MDs per 10,000	11.8%	7.5%	-36.4%
RNs per 10,000	11.5%	10.2%	-11.3%
Private Sector	25.0%	20.2%	-19.2%

Health Workforce in Belize
July 2009

Total Health Workforce

- 2,283 employed in health industry, including 1279 health care providers (56%)
- 1004 in management & support positions

Gender

- Women (68% of workforce) outnumber men 2.2 to 1
- RNs, midwives & community health workers mostly female
- MDs, medical technicians & public health officers mostly male

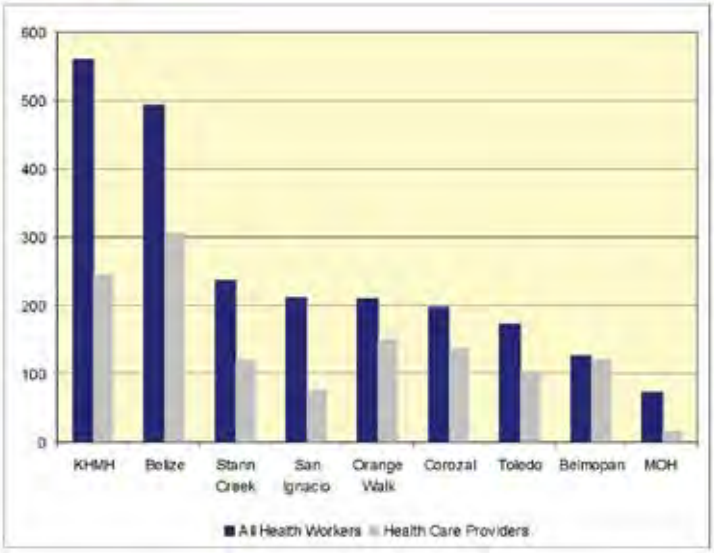
Age

- Relatively young workforce overall
- 25% in 30's, only 4.5% over 55 years
- Community health workers oldest with 12.7% over 55
- Over next decade, 16% of nurses will be over 55

Belize Health Workforce

Region/Major Employer	Total	Percentage
KHMH	562	24.62%
Belize	493	21.59%
Stann Creek	236	10.34%
San Ignacio	212	9.29%
Orange Walk	210	9.20%
Corozal	197	8.63%
Toledo	174	7.62%
Belmopan	126	5.52%
MoH	73	3.20%
Grand Total	2,283	100.0%

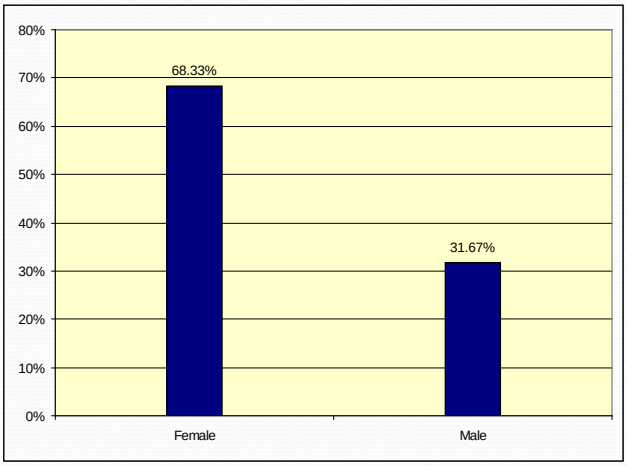
Total Health Workforce



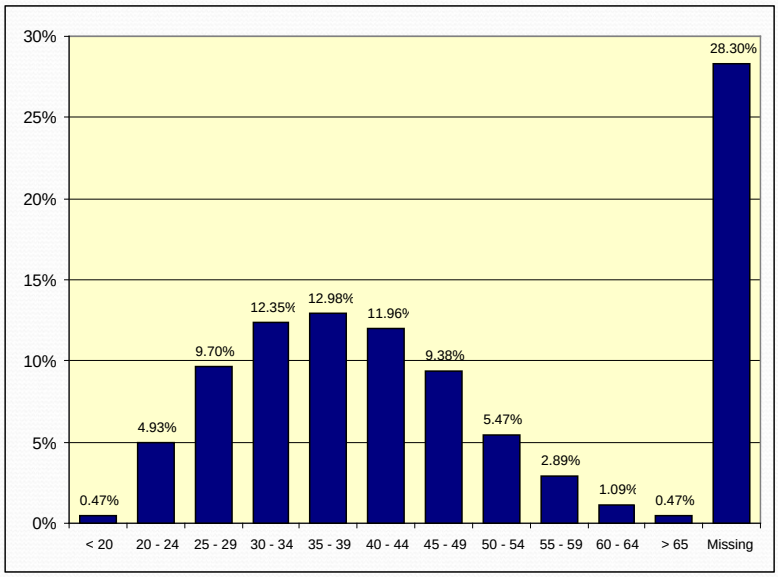
Category of Health Care Providers

Category	Total	Percentage
Nurse	469	36.67%
Medical Doctor	241	18.84%
Community Health Worker	158	12.35%
Medical Technician	126	9.85%
Pharmacist	112	8.76%
Public Health Officer	60	4.69%
Auxiliary Nurse	59	4.61%
Midwife	42	3.28%
Dentist	12	0.94%
Grand Total	1,279	100.0%

Gender of Health Care Providers



Age of Health Care Providers



Health Workforce in Belize
July 2009

Ethnicity

- Over 30 nationalities and ethic groups represented
- Mestizo and Creole represent 61 percent of total
- Creole and Garifuna well represented in workforce
- Mestizo and Maya were only 32.8 % and 3.4% of workforce but were 53.2% and 6.9% of the population overall
- 37.5% spoke English only; 4.7% Spanish only; 41% spoke both

Professional Distribution

- Physicians: 181 GPs and 60 specialists with a HRH density per 10,000 population of 7.5
- Registered nurses: outnumber doctors 1.36 to 1 with a HRH density of 10.2
- Doctors and nurses (including practical nurses) are 55.5% of all health care providers

Ethnicity of Health Care Providers

Ethnicity/Nationality	Total	Percentage
Mestizo	420	32.84%
Creole	359	28.07%
Garifuna	102	7.97%
Nigerian	78	6.10%
Maya	44	3.44%
Cuban	29	2.27%
East Indian	21	1.64%
Ketchi	13	1.02%
African	12	0.94%
Indian	9	0.70%
Missing	149	11.65%

Ratio of HCP per 10,000 Population by District

District	Health Care Provider Category									Grand Total
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer	
Belize (+ KHMH)	0.42	2.81	0.41	11.30	7.08	1.56	25.00	6.25	2.08	57.40
Corozal	1.90	12.23	.54	8.96	1.90	3.26	4.62	2.17	1.36	36.95
Stann Creek	2.70	5.41	.30	6.30	1.50	.30	15.02	3.30	1.20	36.04
Toledo	1.99	12.96	-	4.65	1.66	2.33	7.97	1.99	1.33	34.88
Orange Walk	4.55	0.21	.62	5.79	3.31	0.21	12.42	2.28	2.07	31.47
Cayo	1.43	2.34	.26	4.29	2.73	0.65	10.00	2.08	1.95	25.73
Mod I (Belmopan)	-	(10)	-	(3)	-	(1)	(1)	-	(2)	(17)
Grand Total	1.83	4.91	0.37	7.48	3.79	1.30	14.56	3.48	1.86	39.71

Health Workforce in Belize July 2009

Terms of Employment

- Only 38 percent of positions are “established”, 23 percent filled by volunteers or unestablished positions
- Auxiliary nurses & public heath officers most established
- 20% of MDs and 28% of pharmacists in established posts
- 89% of Community health workers and 19.5% of MDs are volunteers

Public-Private Sectors

- 80% of health care providers work in public sector
- 30% MDs, 44% medical techs & 46% pharmacists, private sector

Geographic Distribution

- 52 percent of Belizeans live in rural areas
- Only 13.6 percent of health care providers live in rural areas
- District of Belize had highest per capita density of health providers
- Cayo District had less than half the District of Belize figure
- By profession, Corozal and Belize Districts had best per capita density of MDs, Toledo and Corozal best density of midwives, with best density of nurses in Belize, Stann Creek and Orange Walk

Terms of Employment of Health Care Providers

Terms of Employment	Total	Percentage
Established	486	38.00%
Board	217	16.97%
Volunteer	171	13.37%
Private Practice	103	8.05%
Contract	83	6.49%
Unestablished	83	6.49%
Volunteer Cuban	44	3.44%
Against Post	9	0.70%
Missing	83	6.49%
Grand Total	1,279	100.0%

Category of HCP by Terms of Employment

Terms of Employment	Health Care Provider Category									Grand Total	Grand Total Percentage
	Auxiliary Nurse	Community Health Worker	Dentist	Medical Doctor	Medical Technician	Midwife	Nurse	Pharmacist	Public Health Officer		
Established	42	10	8	48	56	20	235	31	36	486	38.00%
Board		1		56	35	6	126	13		217	16.97%
Volunteer		140		13	1	2	15			171	13.37%
Private Practice			3	40	17			43		103	8.05%
Contract	2	3		18	2	8	43	7		83	6.49%
Unestablished	13	3	1	1	8	1	27	6	23	83	6.49%
Volunteer Cuban				34	3		6	1		44	3.44%
Against Post	1	1		1	2	1	3			9	0.70%
Missing	1			30	22	4	14	11	1	83	6.49%
Grand Total	59	158	12	240	126	42	469	112	60	1,279	100.0%

Health Workforce in Belize
July 2009

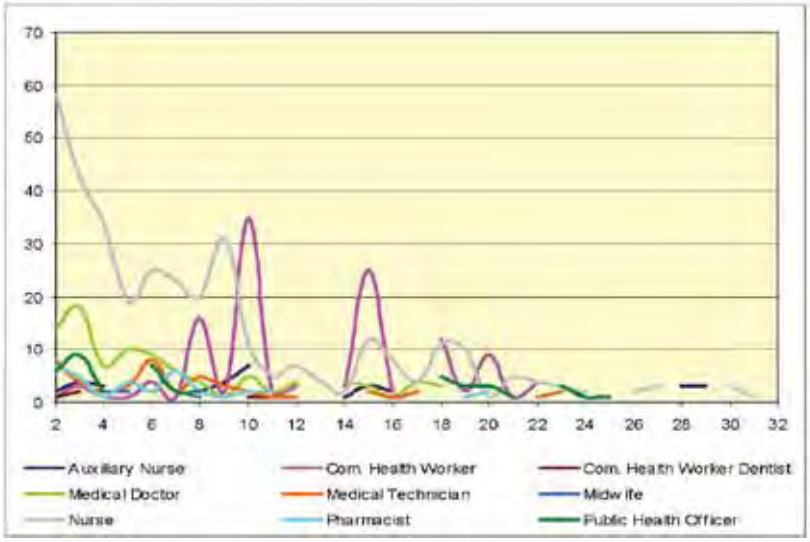
Urban and Rural Distribution

- Only about half the health graduates from University of Belize between 2003 and 2007 are employed in Belize health system
- Of those working, 80 percent return to their home Districts
- Belize and Cayo Districts had most workers in urban areas
- Toledo had the best urban-rural distribution of workers
- 6.2% of MDs, 2.4% of midwives & 3.0% of RNS reside rurally

Recruitment and Retention

- Only 50.6% RN graduates (2003-2007) working in health field
- 80% of those retained returned to their home district
- Belize District had 87% return rate; Toledo lowest at 50%
- Overall employment attrition low – workers in their current jobs an average of 9.5 years
- 13.3% of MDs were employed for 3 years or less

Duration of Employment of Health Care Provider by Category



University of Belize
Health Graduates 2000-2009

Applicants and Student Admissions

- Number of applicants increased from 484 (2000) to 1379 (2008)
- Applicants from Belize District 275 to 624 over decade
- Toledo strongest proportion gain, 12 to 98 applicants
- 31.8% of applications were for Nursing programs
- Acceptance rates are high; registration rates low
- Applicants accepted were high (83% - 88%) across all Districts
- 7000 applicants produced 528 graduates over past decade
- Orange Walk and Corozal Districts proportionately lowest
- Only 50 to 60% of applicants accepted actually register
- Of those who entered health programs between 2001 and 2005 only 34% graduated

University of Belize
Health Graduates 2000-2009

Graduate Demographics

- Over past 9 years 528 graduates (53 annually) from U of Belize
- 82.4 % of graduates are female
- Social workers were oldest graduates; 15% over 50
- 1 in 4 RN and 1 in 3 midwife graduates were over 40
- Graduates are now younger; 58.9% of recent grads in 20's

Language and Ethnicity

- 40.7% of health graduates and 25.3% of population were Creole
- Mayan (3.5%) and Mestizo (24.6%) *not* well represented among graduates relative to their share of the population
- 24.4% of grads spoke English & Spanish; 49.4% just English

University of Belize
Health Graduates 2000-2009

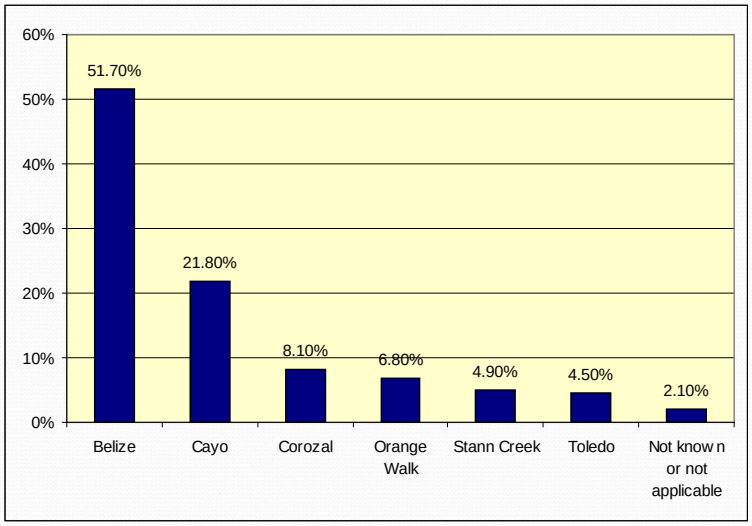
Geographic Distribution

- About 52% of graduates from the District of Belize
- Proportionately lower number of grads from Orange Walk, Stann Creek and Toledo Districts
- Larger towns well represented; Benque Viejo with 1% of the graduates but 5.6% of the population
- 78.6% of graduates from Urban areas, outnumbering rural grads 3.7 to 1

Program Distribution

- Program size and number of graduates exhibited very large variations
- Midwifery graduates varied from a high of 26 in 2002 to a low of 5 in 2009
- Nursing graduates ranged from 5 in 2006 to 26 in 2008

Graduates by District



Graduates by Major and Type of Degree Granted

Major	Type of Degree Granted				Percentage
	Associate	Bachelor	Certificate	Diploma	
Social Work	83	38			22.92%
Pharmacy	79				14.96%
Nursing (BSc)		78			14.77%
Professional Nursing				64	12.12%
Midwifery			58		10.98%
Practical Nursing			58		10.98%
Medical Laboratory Technician	51				9.66%
Psychiatric Nurse Practitioner			13		2.46%
Environmental Health	6				1.14%
Total	219	116	129	64	100.0%

University of Belize Health Graduates 2000-2009

Student Scholarships

- 49.2 % of students received scholarships 2000 to 2009
- Greatest per capita numbers from Cayo and Stann Creek Districts (57%)
- Corozal District had the lowest scholarships overall (37%)
- 60% of RNs and 12 of 13 psychiatric nurses received scholarships

Requirements

- Belize density per 10,000 population of physicians, nurses and midwives is about 18.8; well below the target of 25.
- Net gain of 32 required annually to meet target by 2015; plus 26 more to accommodate population growth
- Output from *all* health programs at UB has only been 53 annually, with nursing and midwives totalling only 14

Implications and Next Steps

- Increase enrolments in health programs at University of Belize
- Recruit more students from rural areas and ethnic populations
- Expand the number and range of scholarships across training programs and Districts
- Improve graduate certification exam pass rates
- Increase uptake of applicants who have been accepted to train
- Reduce student attrition from health training programs
- Enhance graduate retention rates
- Significantly augment the number of employment opportunities for health professional graduates

Summary Implications
Current Strengths

- The proportion of nurses is strong, although shortages persist overall
- Significant rural disparities are supported by Mobile Health Clinics and community health workers
- An HRH Unit/planning function is currently being developed
- Opportunities exist for staff development
- Health and safety and labour negotiation mechanisms are currently in place
- Half of students in training have scholarships and most graduates who are working have returned to their home Districts, although only half recent graduates are currently employed

Summary Implications
Ongoing Challenges

- Currently there is no Code of Practice regarding the recruitment of international health professionals
- There is no policy on “self-sufficiency” regarding the development of HRH in Belize
- The current attrition rate for students in health training programs is about 66 percent; and the pass rate for nurses on the certification exam in any given year is about 50 percent
- The health training programs at the University of Belize are not yet accredited

Next Steps
Areas for Priority Attention

- Formalize a National HRH Advisory Committee with a broad-ranging membership from the health, education and finance sectors to reconfirm HRH priorities and to develop a long-term HRH implementation strategy.
- Provide the core HRH function with the MoH with the necessary resources and support to achieve this goal.
- Finalize a HRH data set to be integrated into the Belize Health Information System to support HRH planning.
- Begin negotiations with the University of Belize to address the issues and concerns that have been identified including a review of its current and potential role and capacity.
- Evaluate the current physician training and recruitment plans.
- Identify the HRH requirements to meet long-term population health needs and review the capacities and options of Belize’s health care delivery system to meet these challenges.

ISBN 978-92-75-13075-9