All-Cause and Cervical Cancer Mortality by Ethnicity in Belize, 2008-2010

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Abstract

INTRODUCTION.Belize is a lower middle income country with Gross National Income per capita in 2010 of US$3,939 [1]. Life expectancy at birth is 76.3 years [2]. Located in Central America, it has a population of 323,359 based on the 2010 census. There are distinct ethnic groups and cultures. Continuous international research has confirmed the relationship between socioeconomic status and health. We have identified few studies on the social determinants of health in the Caribbean, thus the importance of disease surveillance [3]. We have not identified any studies of the social determinants and health status in Belize. OBJECTIVE.To describe social determinants of mortality in Belize. METHODS. A cross sectional descriptive study of mortality utilized the entire Belize population (2010 census data), multiplied by three to correspond with deaths over 3 years, ICD10 (WHO International Classification of Diseases 10th Revision) mortality classification of 2008 – 2010 to calculate deaths, all-cause, sex and cervical cancer mortality rates. Poisson regression compared death rates between ethnicities, using the largest population group, the Mestizos as reference. RESULTS. There were 4,312 deaths in Belize 2008 – 2010. Men had a 40% higher risk of death (IRR –Incidence Risk Ratio 1.4, 95% CI 1.3, 1.5). Crude death rate was 4.4/1,000 population, with highest rates among the dark skinned peoples of the Garifuna (7.9) and Creole (7.5) compared to light-skinned Mestizo (3.2) and Maya (3.3/1000) P-value<0.001. Compared to the Mestizo population, and adjusted for age and sex, Creole all cause mortality IRR was 2.1 (95% CI 1.9, 2.2) and Garifuna was 2.2 (95% CI 1.9, 2.4) Cervical cancer mortality /100,000 women ≥20 years was 9.5 (n=42) ranging from 6.3 to 16.1 among the Mestizo and Maya respectively. Compared to Mestizo women and adjusted for age, the IRR for cervical cancer mortality in Maya women 2.7 (95%CI 1.1, 6.7). CONCLUSIONS. Cervical cancer can and should be managed through screening by Pap smears or VIA (Visual Inspection with Acetic Acid) followed by therapy where indicated. The range of mortality rates by ethnicity in Belize indicates that cervical cancer screening and management programmes for Mayan women need to be reviewed and interventions put in place to address the issues found.

Key words

Belize, overall mortality rates, ethnicity, cervical cancer mortality

■ INTRODUCTION

Belize is a lower middle income country with Gross National Income per capita in 2010 of US$3,939 [1]. Life expectancy at birth is 76.3 years [2]. It is located in Central America and has a population of 323,359 based on the 2010 census. There are distinct ethnic groups and cultures. The Creoles are mostly urban dwellers of mixed descent, and the Mestizos are of Spanish descent. The Maya and Garifuna are considered to be of indigenous descent. The Maya are the original people of the region and the Garifuna are a rural culture of African descent who have maintained that culture. The Belize country poverty assessment for 2010 alludes to the 3 main factors that are associated with ill health, lower socioeconomic status (SES), ethnicity, urban or rural living conditions and individuals of indigenous descent have less access to health, have lower socioeconomic status, have poorer health status [4,5] associated with deficient access to health care, lack of education and gender inequality [6].

Continuous international research has confirmed the relationship between socioeconomic status and health and has been well described in the 2010 Healthy People Report [7] and the WHO Commission on Social Determinants of Health [8]. We have identified few studies on the social determinants of health in the Caribbean thus the importance of disease surveillance[3]. We have not identified any studies of the social determinants and health status in Belize.

The objective was to describe the association between the ethnicity and all-cause and cervical cancer mortality in Belize.

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■ METHODS

This is a cross sectional descriptive study of mortality utilizing the entire Belize population (2010 census data), multiplied by three to correspond with deaths over 3 years. The Ministry of Health in Belize supplied mortality data for 2008 – 2010. We utilized three years of data in order to achieve more stable estimates. Crude mortality rates were calculated using age and ethnicity population counts from the 2010 census, multiplied by three as the denominator, since the numerator was number of deaths over 3 years. WHO International Classification of Diseases 10th Revision (ICD10) was utilized to classify the deaths and all-cause and cervical cancer mortality rates were calculated. Poisson regression compared death rates between ethnicities, using the largest population group, the Mestizos as reference.

■ RESULTS

There were 4,312 deaths in Belize 2008 – 2010. Men had a 40% higher risk of death (IRR –Incidence Risk Ratio 1.4, 95% CI[1] 1.3, 1.5). Crude death rate was 4.4/1,000 population, with highest rates among the dark skinned peoples of the Garifuna (7.9) and Creole (7.5) compared to light-skinned Mestizo (3.2) and Maya (3.3/1000) P-value<0.001. Compared to the Mestizo population, and adjusted for age and sex, Creole all cause mortality IRR was 2.1 (95% CI 1.9, 2.2) and Garifuna was 2.2 (95% CI 1.9, 2.4)

Table 1 displays the crude sex and ethnicity mortality rates. Figure 1 shows crude mortality rate by age group, displaying the categorization of the Global Burden of Disease (GBD) [9] and shows that death rates increase with age, IRR of 1.9 (95%CI 1.8, 1.9) for each 10 year increase in age.

Figure 2 shows the proportion of deaths attributable to GBD categories: Injury, NCDs (Non Communicable Diseases) and

Figure1: Mortality rates by Age and Global Burden of Disease Belize 2008-2010
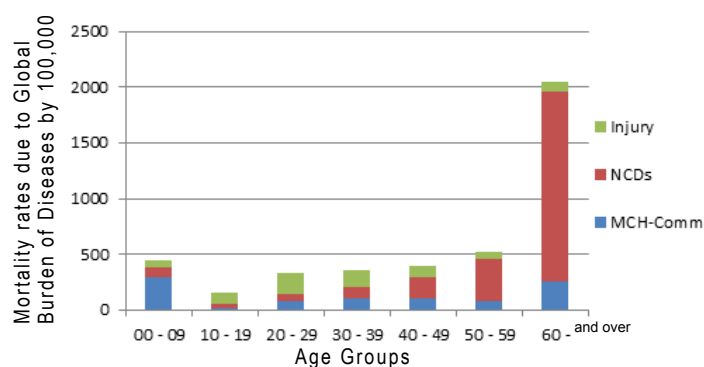
MCH (Maternal and Child Health) by ethnicity. NCDs predominate in all ethnicities, with the indigenous Maya and Garifuna having more MCH/Communicable diseases, and the urban Creoles and Mestizos having more injury.

Figure 3 displays cervical cancer deaths by age and ethnicity. Cervical cancer mortality /100,000 women ≥20 years was 9.5 (n=42 over 3 years) ranging from 6.3 to 16.1 among the Mestizo and Maya, respectively age-adjusted comparison to Mestizo women. The IRR for cervical cancer mortality in Mayan women was 2.7 (95%CI 1.1, 6.7)

■ DISCUSSION

The all-cause mortality rate in this study (4.4/1000) compares with the PAHO estimate of 4.8/1,000 [2]. Cervical cancer mortality rate 2000 estimates were 8.2 to 14.8/100000 women in the Bahamas and Trinidad & Tobago [10]. Cervical cancer is a communicable disease caused by the human papilloma virus (HPV). Options for prevention and control include HPV vaccination before sexual debut, and effective

Table 1 Crude mortality rates by sex and ethnicity, Belize 2008-2010

	Maya	Creole	Garifuna	Mestizos	Other	Not reported	Total
Number of deaths 2008-2010							
Males deaths	150	929	202	869	227	146	2523
Females deaths	153	601	156	642	135	102	1789
Total deaths	303	1530	358	1511	362	248	4312
Population from 2010 census							
Male population	15439	34050	7250	78469	25900	493	161601
Female population	15424	34201	7871	79470	24360	433	161601
Total population	30863	68251	15121	157939	50259	926	323359
*Death rates /1000 population							
Male Crude death rate	3.2	9.1	9.3	3.7	2.9		5.2
Female crude death rate	3.3	5.9	6.6	2.7	1.8		3.7
Total crude death rate	3.3	7.5	7.9	3.2	2.4		4.4

*Death rates calculated as (n deaths/population x 3) *1000

1 Confidence Interval

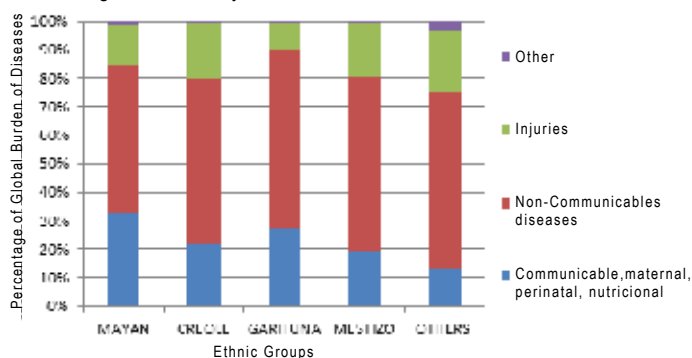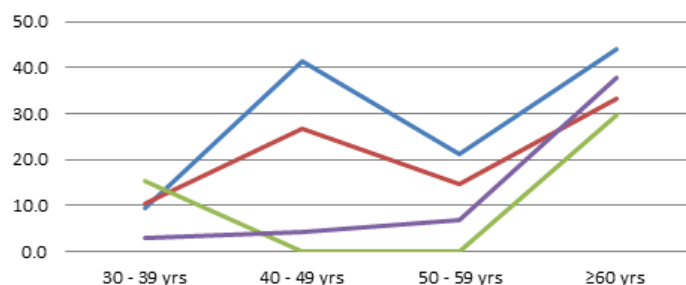Figure 2: Ethnicity and Global Burden of Diseases

Figure 3: Cervical Cancer Mortality Rates /100,000 female population, by Age and Gender, Belize 2008 - 2010

screening programmes for early detection of precancerous cervical legions and removal to prevent development to invasive malignancies [11]. The Pap smear is widely used and effective, but in low resource settings, screening using VIA (Visual Inspection with Acetic Acid) and management with cryotherapy can be accomplished by trained para-medical staff in a single visit [12]

■ CONCLUSIONS / RECOMMENDATIONS

The range of mortality rates by ethnicity in Belize indicate that cervical cancer screening and management programmes for Mayan women need to be reviewed and interventions put in place to address the issues found.

■ REFERENCES

1. United Nations Statistical Division: National Accounts Main Aggregates Database http://unstats.un.org/unsd/snaama/dnl-list.asp

2. PAHO Basic Indicators 2012

3. McCally. M, H. A. (1998). Poverty and ill health;Physicians Can ,and Should,Make a Difference. Ann Intern Med , 726-733.

4. Belize Country poverty Assessment. Belize: World Health Organization 2010

5. Leonard E Egede. Race, Ethnicity, Culture, and Disparities in

Health care. J Gen Intern Med , June 2006; 667-669.

6. Belize Country Cooperation Strategy. Belize: World HealthOrganization 2010

7. Marilyn.Metzler. (2007). Social determinants of Health: What, How,Why and Now. Preventing Chronic diseases, Public Health Resaerch, Practice and Policy , vol 4.

8. Marmot.M. (2005). Social determinants of health inequalities. Lancet , Vol 365.1099 -104.

9. Lopez AD, Begg S, Bos E. Demographic and Epidemiological Characteristics of Major Regions, 1990–2001. In: Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL, editors. Global Burden of Disease and Risk Factors. Washington (DC): World Bank; 2006. Chapter 2

10. J. Ferlay, F. Bray, P.Pisani et al GLOBOCAN 2000: Cancer Incidence, Mortality and Prevalence Worldwide, Version 1.0. IARC CancerBase No. 5 Lyon, IARC Press, 2001

11. Warren JB, Gullett H, King VJ. Cervical cancer screening and updated Pap guidelines. Prim Care. 2009 Mar;36(1):131-49, ix.

12. Nahar KN, Nessa A, Shamim S, Nasrin B, Hossain F, Begum N. Role of VIA in cervical cancer screening in low-resource countries. Mymensingh Med J. 2011 Jul;20(3):528-35