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Preventable Mortality: Indicator or Target? Applications in Developing Countries

Objectives

The purpose of this exercise is to show some applications of mortality statistics based on the concepts of "excess" and "premature" mortality, in the hope they may become useful components of health situation analyses performed by countries with the aim of contributing to priority setting in the health services system, and to surveillance and evaluation of service and program outcomes. Specifically, the gap between the country's current mortality situation and one observed in a more developed country will be quantified for cause-specific data using (a) broad causal categories to visualize changes in the overall mortality structure, and (b) selected, more specific cause groups that might be useful as sentinel or tracer categories. A discussion to estimate gains and challenges in relation to mortality from all causes has been presented in a previous paper *(1)*.

Procedures

Excess mortality will be defined empirically, that is, mortality will be understood to be preventable if it has shown a sustained reduction over time, either in the country being analyzed or in another country being used as reference. The procedures to estimate excess mortality will be the same as for mortality from all causes *(1)*. Two indicators will be used: the standardized mortality ratio (SMR), and the ratio of observed over expected years of potential life lost (RYPLL). Premature mortality will be defined as that occurring under 65 years of age. Both indicators will be computed for each sex; the SMR will be computed for premature mortality and for all ages.

To compute age-specific frequencies age groups are defined as follows: under 1 year of age, 1-4 years, 10-year groups from 5 to 64 years, and 65 years and above.

As before, data from Argentina and Mexico will be used to illustrate the proposed procedures. These two countries were chosen because their population size prevents excessive instability of observed frequencies in specific categories; the proportion of deaths classified as due to symptoms, signs and ill-defined conditions is well under 10%; and their cause-specific mortality structures are different from one another.

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As reference for a more favorable situation the 1982 mortality data for the United States of America (U.S.A.) will be used. The reference population will be the mid-year population estimate for 1982 for Argentina and Mexico respectively. To stabilize the mortality data the average number of deaths occurring in the years 1981-1982-1983, that is, the 3-year average centered on 1982 will be used. Expected deaths will be computed applying the 3-year 1982-centered age-and sex-specific death rates of the U.S.A. to the 1982 population of Argentina and Mexico.

The overall SMR is computed by dividing total observed by total expected deaths; the SMR for mortality under 65 is restricted to the ratio of observed and expected deaths below that age limit. Observed and expected YPLL are computed by multiplying (weighting) age-specific YPLL per death by the observed and expected number of deaths respectively, and adding over all age groups up to but not including 65. The RYPLL is the ratio of the observed YPLL and those expected.

For a general view of the changes in the overall *mortality structure* causes of death were grouped into ten broad categories roughly following the chapters of the 9th Revision of the International Classification of Diseases (ICD-9): 1. Infectious and parasitic diseases (001-139); 2. Neoplasms (140-239); 3. Diseases of the circulatory system (390-459); 4. Diseases of the respiratory system (460-519); 5. Diseases of the digestive system (520-579); 6. Complications of pregnancy, childbirth and the puerperium (630-676); 7. Congenital anomalies (740-759); 8. Certain conditions originating in the perinatal period (760-779); 9. All other diseases (remainder of 001-779); and 10. External causes (E800-E999). Deaths due to symptoms, signs and ill-defined conditions (780-799) are shown separately as an indicator of data quality; they were not redistributed among defined causes. Table 1 (A and B) shows observed and expected deaths for these categories, cause-specific proportional mortality and number and percentage of deaths prior to age 65.

Some *sentinel* or *tracer* categories were defined, to explore their potential use for surveillance and evaluation. They will be described in the next section.

Results

Table 2 (A and B) shows the number and percentage distribution of observed and expected YPLL, the YPLL rates per 100,000 population under 65 and the RYPLL for *broad causal categories*. While for all causes mortality under age 65 accounts for 49 and 37% of all deaths in men and women in Argentina, and for 71 and 60% in Mexico, there is wide cause-specific variation reflecting the age at which different conditions strike (see also Table 1).

The information provided by the SMRs and the RYPLL in comparison to other indicators will be illustrated using two cause-of-death categories only: diseases of the circulatory system (390-459) and infectious and parasitic diseases (001-139). Most countries in the Americas exhibit diseases of the circulatory system among the five leading causes of death while infectious and parasitic diseases rarely appear among the leading five. In Argentina diseases of the circulatory system are the leading cause of death for men in 1982, representing 45% of all male deaths from defined causes, and their mortality rate amounts to 401.4 per 100,000 male population. Infectious and parasitic diseases, by comparison, rank 8th for Argentinian men with 3.3% of all male deaths and a death rate of 29.8 per 100,000 male population, 13.5 times smaller than the rate for the leading cause. The observed YPLL rates are closer to each other, with 1,957 YPLL per 100,000 male population under 65 for diseases of the circulatory system and 901 for infectious and parasitic diseases.

The SMRs for infectious and parasitic diseases are 3.89 for all ages and 5.59 for deaths prior to age 65; for diseases of the circulatory system these ratios are 1.18 and 1.26 respectively. The most striking piece of information, however, is provided by the RYPLL: for Argentinian men this amounts to over 8 observed YPLL from infectious and parasitic diseases for every year of life expected to be lost due to this cause group according to U.S.A. rates, while for diseases of the circulatory system the multiplying factor is only about 1.5. This situation is even more pronounced in Mexico, where for infectious and parasitic diseases the YPLL observed for women exceed YPLL expected according to U.S.A. rates by a factor of 33, while there appears practically no excess for disease of the circulatory system.

In some countries deaths due to complications of pregnancy, childbirth and the puerperium (630-676) are used as sentinel events; any death in this category is deemed excessive, and an investigation of the why and how is set in motion whenever one occurs. However, although important progress has been achieved in regard to improving maternal care, the RYPLL for maternal deaths still exceeds 13 in Argentina and 24 in Mexico.

Although originally defined from a different perspective *(2,3), the concept of tracer* and *sentinel* categories can be extended to include cause groups which

Table 1. Deaths observed in 1982 and expected according to U.S.A. 1982 rates by broad causal categories. Argentina and Mexico.

A. Argentina

Causes of death	Males				Females			
	All ages		Under 65		All ages		Under 65	
	Number	% all causes	Number	% all ages	Number	% all causes	Number	% all ages
Observed deaths, 1982								
All causes (001-E999)	133,887	100.0	66,019	49.3	102,429	100.0	38, 329	37.4
Symptoms and ill-defined conditions (780-799)	3,511	2.6	2,090	59.5	2,729	2.7	1,405	51.5
Total from defined causes	130,376	100.0	63,929	49.0	99,701	100.0	36,925	37.0
Infectious and parasitic diseases (001-139)	4,323	3.3	3,125	72.3	3,388	3.4	2,362	69.7
Neoplasms (140-239)	24,098	18.5	11,292	46.9	18,199	18.2	8,108	44.6
Diseases of the circulatory system (390-459)	58,212	44.6	20,134	34.6	49,135	49.3	9,546	19.4
Diseases of the respiratory system (460-519)	8,141	6.2	3,751	46.1	5,413	5.4	2,283	42.2
Diseases of the digestive system (520-579)	7,467	5.7	4,128	55.3	4,771	4.8	1,923	40.3
Complications of pregnancy, childbirth and the puerperium (630-676)	..	..	..	..	443	0.4	443	100.0
Congenital anomalies (740-759)	1,557	1.2	1,543	99.1	1,345	1.3	1,330	98.9
Certain conditions originating in the perinatal period (760-779)	5,543	4.3	5,543	100.0	4,108	4.1	4,108	100.0
All other diseases (Remainder of 001-779)	9,550	7.3	4,834	50.6	8,591	8.6	3,845	44.8
External causes (E800-E999)	11,485	8.8	9,578	83.4	4,307	4.3	2,976	69.1
Expected deaths according to 1982 U.S.A. rates								
All causes (001-E999)	111,847	100.0	49,955	44.7	79,621	100.0	27,776	34.9
Symptoms and ill-defined conditions (780-799)	2,094	1.9	1,433	68.4	1,356	1.7	840	61.9
Total from defined causes	109,753	100.0	48,522	44.2	78,265	100.0	26,936	34.4
Infectious and parasitic diseases (001-139)	1,110	1.0	559	50.4	888	1.1	393	44.3
Neoplasms (140-239)	24,638	22.4	10,396	42.2	18,959	24.2	8,818	46.5
Diseases of the circulatory system (390-459)	49,456	45.1	15,944	32.2	37,496	47.9	6,797	18.1
Diseases of the respiratory system (460-519)	7,801	7.1	2,031	26.0	4,524	5.8	1,223	27.0
Diseases of the digestive system (520-579)	4,271	3.9	2,407	56.4	3,032	3.9	1,307	43.1
Complications of pregnancy, childbirth and the puerperium. (630-676)	..	..	..	..	32	0.0	32	100.0
Congenital anomalies (740-759)	1,220	1.1	1,183	97.0	1,067	1.4	1,027	96.3
Certain conditions originating in the perinatal period (760-779)	2,207	2.0	2,207	100.0	1,667	2.1	1,667	100.0
All other diseases (Remainder of 001-779)	6,394	5.8	2,747	43.0	6,111	7.8	2,165	35.4
External causes (E800-E999)	12,656	11.5	11,048	87.3	4,489	5.7	3,507	78.1

Table 1 (cont'd). Deaths observed in 1982 and expected according to U.S.A. 1982 rates by broad causal categories. Argentina and Mexico.

B. Mexico

Causes of death	Males				Females			
	All ages		Under 65		All ages		Under 65	
	Number	% all causes	Number	% all ages	Number	% all causes	Number	% all ages
Observed deaths, 1982								
All causes (001-E999)	232,691	100.0	164,416	70.7	173,795	100.0	103,911	60.0
Symptoms and ill-defined conditions (780-799)	11,823	5.1	6,949	58.8	11,173	6.4	5,793	51.8
Total from defined causes	220,868	100.0	157,467	71.3	162,622	100.0	98,117	60.3
Infectious and parasitic diseases (001-139)	27,309	12.4	22,830	85.6	23,727	14.6	19,446	81.2
Neoplasms (140-239)	13,929	6.3	6,604	47.4	16,913	10.4	9,425	55.7
Diseases of the circulatory system (390-459)	34,619	15.7	14,034	40.5	35,223	21.7	11,406	32.4
Diseases of the respiratory system (460-519)	27,183	12.3	17,917	65.9	22,868	14.1	14,253	62.3
Diseases of the digestive system (520-579)	21,054	9.5	14,751	70.1	11,122	6.8	5,983	53.8
Complications of pregnancy, childbirth and the puerperium (630-676)	..	..	..	..	2,148	1.3	2,148	100.0
Congenital anomalies (740-759)	3,480	1.6	3,464	99.5	2,995	1.8	2,977	99.4
Certain conditions originating in the perinatal period (760-779)	13,188	6.0	13,188	100.0	9,165	5.6	9,165	100.0
All other diseases (Remainder of 001-779)	27,928	12.6	16,854	60.3	26,572	16.3	13,508	50.8
External causes (E800-E999)	52,177	23.6	47,825	91.7	11,889	7.3	9,805	82.5
Expected deaths according to 1982 U.S.A. rates								
All causes (001-E999)	160,012	100.0	88,994	55.6	106,867	100.0	50,816	47.6
Symptoms and ill-defined conditions (780-799)	4,368	2.7	3,610	82.6	2,818	2.6	2,261	80.2
Total from defined causes	155,644	100.0	85,384	54.9	104,049	100.0	48,555	46.7
Infectious and parasitic diseases (001-139)	1,725	1.1	1,092	63.3	1,355	1.3	820	60.5
Neoplasms (140-239)	30,492	19.6	14,305	46.9	23,529	22.6	12,647	53.8
Diseases of the circulatory system (390-459)	59,797	38.4	21,221	35.5	42,739	41.1	9,460	22.1
Diseases of the respiratory system (460-519)	9,915	6.4	3,259	32.9	5,681	5.5	2,111	37.2
Diseases of the digestive system (520-579)	5,681	3.6	3,555	62.6	3,882	3.7	2,020	52.0
Complications of pregnancy, childbirth and the puerperium. (630-676)	..	..	..	..	81	0.1	81	100.0
Congenital anomalies (740-759)	3,904	2.5	3,862	98.9	3,407	3.3	3,365	98.8
Certain conditions originating in the perinatal period (760-779)	7,491	4.8	7,491	100.0	5,662	5.4	5,662	100.0
All other diseases (Remainder of 001-779)	9,193	5.9	4,988	54.3	8,213	7.9	3,948	48.1
External causes (E800-E999)	27,446	17.6	25,611	93.3	9,500	9.1	8,441	88.9

Source: PAHO technical data base.

Table 2. Years of potential life lost by broad causal categories. Argentina and Mexico, 1982.

A. Argentina

Causes of death	YPLL (thousands) Obs.	Exp.	Percent Obs.	Exp.	YPLL rate (a) Obs.	Exp.	RYPLL Obs/Exp
Males							
All causes (001-E999)	1,702.4	1,081.4	100.0	100.0	12,655.9	8,037.6	1.57
Symptoms and ill-defined conditions (780-799)	80.9	59.1	4.8	5.5	601.7	439.3	1.37
Total from defined causes	1,621.5	1,022.3	100.0	100.0	12,054.0	7,598.1	1.59
Infectious and parasitic diseases (001-139)	121.2	14.7	7.5	1.4	901.1	109.3	8.24
Neoplasms (140-239)	147.9	122.6	9.1	12.0	1,099.4	911.1	1.21
Diseases of the circulatory system (390-459)	263.3	176.2	16.2	17.2	1,957.4	1,309.8	1.49
Diseases of the respiratory system (460-519)	125.1	35.0	7.7	3.4	930.1	260.3	3.57
Diseases of the digestive system (520-579)	64.2	37.0	4.0	3.6	476.9	274.9	1.74
Complications of pregnancy, childbirth and the puerperium (630-676)	..	..	..	..	..	..	..
Congenital anomalies (740-759)	95.8	70.4	5.9	6.9	712.4	523.0	1.36
Certain conditions originating in the perinatal period (760-779)	357.4	142.3	22.0	13.9	2,657.2	1,058.0	2.51
All other diseases (Remainder of 001-779)	146.5	61.6	9.0	6.0	1,088.8	457.8	2.38
External causes (E800-E999)	299.9	362.6	18.5	35.5	2,229.6	2,695.7	0.83
Females							
All causes (001-E999)	1,159.0	617.4	100.0	100.0	8,699.8	4,635.1	1.88
Symptoms and ill-defined conditions (780-799)	61.3	38.0	5.3	6.2	460.1	285.1	1.61
Total from defined causes	1,097.6	579.4	100.0	100.0	8,239.2	4,349.5	1.89
Infectious and parasitic diseases (001-139)	103.8	11.1	9.5	1.9	778.9	83.0	9.39
Neoplasms (140-239)	120.4	111.0	11.0	19.2	904.1	833.4	1.08
Diseases of the circulatory system (390-459)	145.8	77.6	13.3	13.4	1,094.3	582.6	1.88
Diseases of the respiratory system (460-519)	94.7	23.9	8.6	4.1	710.8	179.3	3.96
Diseases of the digestive system (520-579)	35.9	20.5	3.3	3.5	269.2	154.1	1.75
Complications of pregnancy, childbirth and the puerperium. (630-676)	15.6	1.2	1.4	0.2	116.8	8.9	13.08
Congenital anomalies (740-759)	82.6	61.2	7.5	10.6	620.0	459.4	1.35
Certain conditions originating in the perinatal period (760-779)	265.0	107.5	24.1	18.6	1,988.9	807.0	2.46
All other diseases (Remainder of 001-779)	127.1	46.7	11.6	8.1	954.0	350.5	2.72
External causes (E800-E999)	106.9	118.7	9.7	20.5	802.6	891.1	0.90

(a) Rates per 100,000 population under age 65.

Table 2 (cont'd). Years of potential life lost by broad causal categories. Argentina and Mexico, 1982.

B. Mexico

Causes of death	YPLL (thousands) Obs.	Exp.	Percent Obs.	Exp.	YPLL rate (a) Obs.	Exp.	RYPLL Obs/Exp
			Males				
All causes (001-E999)	6,441.9	2,741.4	100.0	100.0	18,162.1	7,728.7	2.35
Symptoms and ill-defined conditions (780-799)	289.5	183.2	4.5	6.7	816.2	516.5	1.58
Total from defined causes	6,152.4	2,558.2	100.0	100.0	17,345.9	7,212.8	2.40
Infectious and parasitic diseases (001-139)	1,208.2	40.2	19.6	1.6	3,406.4	113.4	30.03
Neoplasms (140-239)	143.0	221.5	2.3	8.7	403.3	624.6	0.65
Diseases of the circulatory system (390-459)	296.9	287.8	4.8	11.3	837.1	811.5	1.03
Diseases of the respiratory system (460-519)	943.8	86.7	15.3	3.4	2,660.8	244.4	10.89
Diseases of the digestive system (520-579)	309.0	69.6	5.0	2.7	871.2	196.2	4.44
Complications of pregnancy, childbirth and the puerperium (630-676)	..	..	..	..	..	..	..
Congenital anomalies (740-759)	215.8	237.3	3.5	9.3	608.4	669.1	0.91
Certain conditions originating in the perinatal period (760-779)	850.6	483.1	13.8	18.9	2,398.2	1,362.0	1.76
All other diseases (Remainder of 001-779)	526.0	156.4	8.6	6.1	1,483.1	440.9	3.36
External causes (E800-E999)	1,659.0	975.6	27.0	38.1	4,677.3	2,750.5	1.70
			Females				
All causes (001-E999)	4,320.8	16,370.5	100.0	100.0	12,305.2	4,663.2	2.64
Symptoms and ill-defined conditions (780-799)	247.6	1,208.5	5.7	7.4	705.1	344.2	2.05
Total from defined causes	4,073.2	15,162.0	100.0	100.0	11,600.1	4,318.7	2.69
Infectious and parasitic diseases (001-139)	10,510.4	317.8	25.8	2.1	2,993.3	90.5	33.07
Neoplasms (140-239)	1,812.0	2,033.3	4.4	13.4	516.0	579.1	0.89
Diseases of the circulatory system (390-459)	2,555.4	1,414.8	6.3	9.3	727.8	402.9	1.81
Diseases of the respiratory system (460-519)	7,692.8	619.5	18.9	4.1	2,190.8	176.4	12.42
Diseases of the digestive system (520-579)	1,418.1	421.5	3.5	2.8	403.9	120.0	3.36
Complications of pregnancy, childbirth and the puerperium. (630-676)	758.6	31.1	1.9	0.2	216.0	8.8	24.43
Congenital anomalies (740-759)	185.3	2,070.3	4.5	13.7	527.6	589.6	0.89
Certain conditions originating in the perinatal period (760-779)	5,911.4	3,651.4	14.5	24.1	1,683.5	1,039.9	1.62
All other diseases (Remainder of 001-779)	4,255.0	1,211.2	10.4	8.0	1,211.8	344.9	3.51
External causes (E800-E999)	3,964.2	339.1	9.7	22.4	1,129.0	965.7	1.17

(a) Rates per 100,000 population under age 65.

Source: PAHO technical data base.

might be used for surveillance of certain health situations or, at least, to illustrate the road still ahead. Table 3 shows three categories which, among others, might serve this purpose. Diseases preventable by vaccination, such as diphtheria, whooping cough, tetanus, poliomyelitis and measles (032; 033; 037; 045; 055) comprise a category useful for evaluation of vaccination programs. The category of intestinal infectious diseases (001-009) is proposed as an indicator of sanitary conditions and the nutritional status of the population. Finally, appendicitis, hernia and intestinal obstruction (540-543; 550-553; 560) is proposed as a category for assessing the quality of abdominal surgery, and even, to a certain extent, of general surgery and hospital care.

The discrepancies between observed and expected deaths, and, in consequence between observed and expected YPLL rates and the RYPLL itself are striking enough and the messages they convey differ sharply from those obtained when examining only leading causes of death and mortality rates. While reinforcing the conclusions regarding the importance of the category of infectious and parasitic diseases as a whole (Table 2), the first category of Table 3--vaccination programs--evidences a persistent public health challenge, while the second--sanitation and nutrition--may respond more to overall development, public health included. It is notable, and deserves further research, that the gap between developing and developed countries seems smaller once intra-hospital medical care is involved, as for abdominal surgery.

Discussion and Conclusions

An important consideration relevant to cause-specific analyses is the fact that mortality statistics in their usual form are based solely on the underlying cause of death and therefore tend to underestimate conditions rarely recorded as such, as is the case for malnutrition, among others *(4)*. In addition, it should be kept in mind that the way causal categories are grouped may greatly influence their relative ranking. These issues were discussed at a recent meeting on mortality analysis at which different criteria for cause-groupings, and the construction and use of the YPLL were presented by research teams from several Latin American countries *(5-7)*. One of the recommendations called for improved use of available data and the promotion of simple procedures such as YPLL to highlight preventable mortality.

In some countries in Latin America there exists a long tradition in the use of mortality analyses to assess health differentials *(8)*. Only a few specific examples will be mentioned: Behm *(9)* set a trend in regard to the analysis and interpretation of infant mortality in 1962; Taucher's avoidability criteria do not seem to have been fully exploited so far, in spite of their application in several countries *(10)*; Becker started using YPLL in 1984 *(11)*. Although comparative evaluations exist, there has not been an emphasis on target rates. Nor is there in this paper, since it is felt that, with few exceptions, conditions responsible for premature death in the developing countries of the Region of the Americas will respond only in part to actions of the health sector: health status appears to be more strongly influenced by the overall living conditions still prevailing for the vast majority of the population in those countries. This aspect, which to a lesser degree also seems to hold in the developed world, as Buck *(12,13)* and others have pointed out, should be kept in mind when societal determinants are interpreted as being individual choices and targeted for intervention *(14-16)*.

It should be remembered that SMRs and RYPLLs of different countries should be compared only to the extent that one would compare crude rates, as the population of each country is used in both numerator and denominator *(17)*. By the same token this simplifies interpretation, since the only difference in numerator and denominator of each ratio derives from the mortality rates used. Furthermore, cause-specific YPLLs represent the number of years lost due to the cause in question under the assumption that --up to the age set as the indicator's upper limit--the decedent would not have died from any other cause. Thus, unlike life table measures computed for competing risks, YPLL do not address the question of how much life expectancy would be gained should a certain causal category be eliminated or reduced *(18)*.

Another important choice involves the reference rates to be used, especially when assessing the gap between what is and what could be. This choice is entirely dependent on the purpose and intentionality of any given analysis, and the decisions to be based on it. In this context, and also in regard to sentinel categories, it is important to distinguish between outcome measures and health status indicators. Mortality from diseases preventable by vaccination can be easily interpreted as failure of the vaccination program, while mortality from intestinal infectious diseases appears to carry a more general message about prevailing health and general living conditions. It is well documented that some indicators such as infant mortality do not maintain their correlation with overall health or development status after having been subjected to sustained and effective interventions: they then measure--at least in part--the outcome of the intervention program.

Table 3. Ratios of years of potential life loss for sentinel categories related to different problems. Argentina and Mexico, 1982.

Sentinel categories for problems related to	Males					Females				
	Deaths under 65		YPLL rates(a)		RYPLL	Deaths under 65		YPLL rates(a)		RYPLL
	Obs.	Exp.	Obs.	Exp.	Obs/Exp	Obs.	Exp.	Obs.	Exp.	Obs/Exp
					Argentina					
Vaccination programs (b)	99	-	37.3	-	..	116	1	39.9	0.5	83.0
Sanitation and nutrition (c)	914	23	417.9	9.2	45.4	809	18	375.1	6.6	56.7
Abdominal surgery (d)	261	82	53.4	17.7	3.0	211	65	38.7	11.7	3.3
					Mexico					
Vaccination programs (b)	913	1	140.8	0.2	780.4	1,053	2	155.9	0.4	424.4
Sanitation and nutrition (c)	16,463	65	2,702.0	11.0	246.4	14,227	52	2,355.0	8.7	269.9
Abdominal surgery (d)	757	172	79.2	19.7	4.0	675	123	66.5	12.3	5.4

Note: Discrepancies with figures in previous tables are due to rounding.

(a) Rates per 100,000 population under age 65.
(b) Diphtheria (032), whooping cough (033), tetanus (037), acute poliomyelitis (045) and measles (055).
(c) Intestinal infectious diseases (001-009).
(d) Appendicitis (540-543), hernia of abdominal cavity (550-553) and intestinal obstruction without mention of hernia (560).

Source: PAHO technical data base.

Cause-specific reference rates can be defined based on the knowledge of state-of-the-art technology, and they can be constructed according to prospective planning or scenario techniques. They can also be chosen empirically, as was done here, based on observed mortality reduction in a more developed country.

As stated before, the indicators discussed can be used to highlight differentials and inequalities within a country: on a subnational level, the reference rates could be those of that region or area in the country exhibiting the least unfavorable sanitary conditions, as Farr proposed over 150 years ago. But, although in almost all countries of the Americas there exist mortality statistics of sufficient completeness to do this comparative exercise for mortality from all causes, cause-specific analysis will be restricted by data quality.

The ratios discussed should be a useful complement of the more traditional indicators. They are geared towards analysis to be used by a country or subnational area for its own benefit. Countries in the Americas are invited to replicate this exercise and enrich it with their own perspectives and experience. The quest for better mortality indicators and their application will no doubt contribute new insights to the health-disease processes. However, it should not be forgotten that low mortality is not synonymous with good health. The goals of public health are not--or should not be--restricted to making life longer; they should aim at making life better.

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(*Source:* Health Situation and Trend Assessment Program, PAHO. Based on Plaut, R. and Roberts, E. Preventable mortality: indicator or target? Applications in developing countries. *Wld hlth statist. quart.* 42(1): 4-15, 1989.)

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Preventable Mortality Criteria. Cuba

Editor's Note:

This article is part of a study on health profiles and evaluation of mortality in Cuba in a three-year period of each decade of the revolutionary period, prepared with the support of the PAHO/WHO Research Grants Program and presented at the Regional Meeting on Guidelines and Procedures for Mortality Analysis, held in Washington, D.C., from 22 to 26 February 1988. The original document consists of the following chapters: determining factors of the state of health of the population; population and fertility; mortality (primary purpose of the paper); morbidity, human growth and development, and nutritional surveillance; and organization of the health system. The chapter on Mortality discusses the coverage and quality of the data, including medical certification of death. The methodology used in the research is described, together with the results of the study in terms of the evolution of mortality and analysis of the leading causes of death, both for the country as a whole and in four provincial capital cities. The periods analyzed, the information on mortality and the methodology employed in this article are the same as those used in the original study.

The publication of this article has been considered of interest to the readers of the Bulletin because it constitutes another illustration of how mortality analysis can be enriched by the complementary use of different indicators and classification criteria. However, the selection of which to use will depend on the objectives and circumstances of each particular case.

The purpose of this article is to analyze mortality in terms of the criterion of preventable death. This criteria is defined in accordance with current scientific knowledge and the medical progress achieved to date, and it was considered appropriate to use the classification employed in a similar study published by the Latin American Demography Center (CELADE)*(1)* as a point of departure. The analysis presented in the paper is expanded with an estimate of the potential years of life lost (YPLL).

The assignment of some causes of death to one group or another according to their preventability has a subjective component and, as such, is dependent on different criteria; however, if the same criterion is used for different periods the results are comparable and provide an acceptable approach to reality. It should also be borne in mind that this type of work is founded on the idea of preventing early death, that is, of prolonging life, which at times is achieved by preventing disease and at others by treating it adequately once it occurs.

The criteria for prevention and health education are applicable to all groups, since even with regard to diseases considered to be unpreventable or preventable with difficulty it is being demonstrated that the control of risk factors, the change of habits harmful to health, and other preventive measures are capable of mitigating or preventing chronic and degenerative