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Situation Analysis of Mortality in Bolivia

Introduction

The latest report on mortality in Bolivia was issued in 1990. The three leading causes of death were infectious and parasitic diseases (23.9%), diseases of the circulatory system (19.5%), and diseases of the respiratory tract (14%), followed by accidents and violence (9.8%), disorders of the digestive system (8.6%), affections originating in the perinatal period (7.4%), and tumors (4%).¹

Bolivia lacks a national vital statistics information system and the process of automation and modernization of the national civil registration system, which is dependent on the National Electoral Court (Corte Nacional Electoral, CNE), is slow in coming. A recent inter-institutional coordination effort by the Ministry of Health and Social Welfare (MHSW), the National Directorate of Civil Registration (Dirección Nacional de Registro Civil, DNRC), and the National Institute of Statistics (Instituto Nacional de Estadísticas, INE) is trying to solve this problem. In 2002, a collection system for medically certified deaths has been put in place in all the hospitals of the national health system, using a standard death certificate.

As part of the technical cooperation that PAHO provides to the Ministry of Health to strengthen the health information system, epidemiological surveillance, and health situation analysis in the country, a plan for the study of mortality was implemented, covering the years 2000 and 2001. This study was carried out using registries of medically certified deaths from 9 cemeteries located in departmental capital cities, representing about 43% of the Bolivian population.

Current situation

For 2000-2005, INE and the Latin American Demography Center (CELADE for its Spanish name) estimates Bolivia's crude death rate to be 8.2 per 1,000 population and life expectancy 63.6 years for the same period. Table 1 presents the

crude mortality rates and life expectancy at birth for Latin America, Bolivia, and the 9 departments of Bolivia in the periods 1990-1995 and 2000-2005.²

The most recent survey on demography and health, implemented in 1998, estimated the infant mortality rate in Bolivia at 67 per 1,000 live births and the under five mortality rate at 92 per 1,000 live births for the period 1993-1997.³ For the year 2002, MHSW and PAHO estimated those rates at 50 and 72 per 1,000 live births, respectively.⁴ Figure 1 presents the proportional distribution of mortality in the under 5 by registered cause.⁴

Under-registration of mortality was estimated at 63% in 1999, with variations in the departments ranging between 47% in Beni and 89% in Pando. Table 2 presents estimates provided by the DNRC of mortality under-registration by department for this same year, calculated from estimated population data, crude mortality rates, and expected and regis-

Table 1: Crude mortality rate and life expectancy at birth for Latin America and Bolivia and its departments, 1990-1995 and 2000-2005

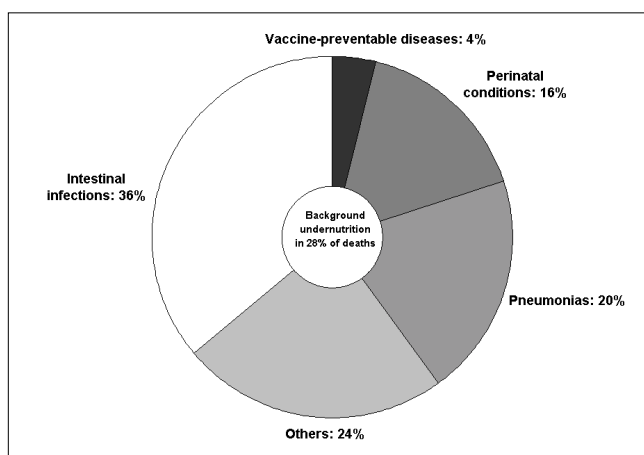
	Crude mortality rate (both sexes)		Life expectancy at birth (both sexes)	
	1990-1995	2000-2005	1990-1995	2000-2005
Latin America	8.3	7.7	65.4	68.1
Bolivia	10.2	8.2	59.3	63.6
La Paz	9.8	8.6	60.5	61.7
Santa Cruz	7.2	5.9	63.7	67.7
Cochabamba	10.5	8.3	59.1	63.2
Tarija	8.1	6.6	63.1	67.3
Potosi	14.7	11.1	53.0	58.9
Beni	10.5	8.0	57.4	61.9
Pando	9.7	7.8	58.0	62.6
Chuquisaca	11.8	8.9	57.8	62.2
Oruro	13.3	10.8	53.7	59.3

Source: INE/CELADE

IN THIS ISSUE ...

- *Health Situation Analysis:*
 - Situation Analysis of Mortality in Bolivia
 - The Global Youth Tobacco Survey: Results in the Americas
- A Glossary for Social Epidemiology (Part II)
- *Norms and Standards in Epidemiology:*
 - Case definitions: Acute Viral Hepatitis; Leprosy.

Figure 1: Proportional distribution of mortality in children under five years of age by major groups of causes of death, Bolivia, 1994-1997



tered deaths. In the case of the Department of La Paz, the information is also presented for the capital city, called “Sala Murillo”, and for the remainder of the Department.

Aside from under-registration, another problem in mortality data is the quality of death certification. A study of the quality of death registration in the La Paz general cemetery (S. Murillo), found that “cardio-respiratory arrest” was used in 57% of the certificates, which only indicates that the person died, without providing any information on the cause of death.⁵

The limitations in the mortality registration, whether related to coverage (under-registration) or data quality, are also encountered in the birth registry system. In 1999, under-registration of births was estimated at 34%, with values ranging between 0% in Tarija and Pando and 63% in Santa Cruz (table 3). Reported under-registration of 0% in the departments of Tarija and Pando may be attributed to the use of demographic estimators that do not take into account recent substantial

migratory movements to these departments recorded in other demographic reports.⁶ To reduce the natality under-registration, a proposal is in place to cancel the present fees for the registration of newborns in civil registration offices.

Study of Mortality 2000

The study included 10,744 medically certified death records in 21 cemeteries in the 9 departmental capitals (1 by city, except Santa Cruz, where 13 cemeteries were used). Cemeteries were selected for their geographic location, whether they belonged to the municipal or public system, and the availability of mortality records and data from the year 2000.⁷

Information was collected from death certificates in the civil registry from the year 2000. When the medical death certification was issued on a document that did not correspond to the official death certificate, the information was collected through a specially-designed, validated instrument. This process was followed in less than 5% of the cases. Duplicate certificates, certificates issued for persons who had died outside of the country, and incomplete certificates (without age, sex, or diagnosis) were excluded. These corresponded to 2.4% of all registries. The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, was used to code the data. PAHO’s 6/67 list (6 groups, 67 subgroups) was used to group mortality causes.⁸

Estimated numbers of deaths were based on the registered deaths collected for the study, using procedures recommended by PAHO to adjust for under-registration and ill-defined deaths.⁹ Table 4 presents the number of collected certificates and estimated deaths by capital city, as well as the reference population. The reference population was defined as the fraction of the departmental population proportional to the “collection coverage” for each cemetery. The “collection coverage” was defined in each cemetery as the proportion of certificates collected, with respect to the total of deaths in the civil registry in each department in 1999.

Table 2: Estimation of mortality under-registration in the National Vital Statistics System, based on civil registration, Bolivia and departments, 1999

Department	Population ¹	Crude Mortality Rate (per 1,000) ²	Expected deaths	Registered deaths	% registered	Under-registration (%)
La Paz	2,359,724	9.3	21,899	9,901	45	55
Sala Murillo	786,812	9.3	7,302	6,807	93	7
Rest of the Department	1,572,912	9.3	14,597	3,094	21	79
Santa Cruz	1,757,409	6.5	11,458	2,789	24	76
Cochabamba	1,484,867	9.4	13,913	6,056	44	56
Tarija	391,225	7.3	2,844	1,441	51	49
Potosi	765,254	12.5	9,566	3,040	32	68
Beni	355,983	9.0	3,186	1,700	53	47
Pando	55,885	8.6	479	54	11	89
Chuquisaca	576,287	10.1	5,838	811	14	86
Oruro	390,478	11.9	4,627	1,724	37	63
Total	8,137,112	9.1	73,966	27,516	37	63

Source: ¹ INE projection, 1999, ² INE estimation, PRODEM 2.0, CELADE, INE, 1996, ³ National Civil Registration Directorate, National Electoral Court, 1999

Table 3: Estimation of natality under-registration in the National Vital Statistics System, based on civil registration, Bolivia and departments, 1999

Department	Population ¹	Crude Birth Rate (p. 1,000) ²	Expected births	Registered births	% registered	Under-registration (%)
La Paz	2,359,724	31.4	74,095	51,626	70	30
<i>Sala Murillo</i>	786,812	31.4	24,706	22,124	90	10
<i>Rest of the Department</i>	1,572,912	31.4	49,389	29,502	60	40
Santa Cruz	1,757,409	33.7	59,277	21,830	37	63
Cochabamba	1,484,867	34.3	50,886	44,340	87	13
Tarija	391,225	33.3	13,016	13,006	100	0
Potosi	765,254	33.6	25,713	23,143	90	10
Beni	355,983	36.7	13,061	7,250	56	44
Pando	55,885	32.4	1,808	1,802	100	0
Chuquisaca	576,287	36.2	20,844	9,355	45	55
Oruro	390,478	30.4	11,851	7,462	63	37
Total	8,137,112	33.2	270,478	179,814	66	34

Source: ¹ INE projection, 1999, ² INE estimation, PRODEM 2.0, CELADE, INE, 1996, ³ DNRC, CNE, 1999

The proportional distribution of mortality by major cause of death groups is presented in table 5. This table shows that 4 out of 10 deaths registered in the capital cities of the country were attributed to causes related to the circulatory system. This proportion is slightly higher for women. The high proportion of deaths from this cause may be biased by the frequent use of the term “cardio-pulmonary arrest” as the underlying cause of death. On the other hand, also worthy of note is the high proportion of external causes of death among males and of neoplastic causes of death among women.

The estimated general mortality rates show clear differences between departmental capitals and are consistently higher in men (table 6). According to this study, the absolute risk of dying is highest in Pando and Potosi and lowest in Santa Cruz. At the country level, the estimated total mortality rate was 9.2 per 1,000 population, consistent with the INE/CELADE estimate.

Table 7 presents the estimated cause-specific mortality rates by major groups of causes of death, expressed per

Table 4: Collected deaths, estimated deaths and reference population used in the study, Bolivia, 2000

General Cemetery	Deaths		Reference population
	Collected	Estimated	
La Paz (S. Murillo)	3,563	3,871	411,842
Santa Cruz	1,499	6,280	944,552
Cochabamba	2,047	4,791	501,903
Tarija	564	1,110	153,123
Potosi	687	2,188	172,937
Trinidad ¹	343	652	71,825
Cobija ²	78	726	55,885
Sucre ³	882	6,326	576,287
Oruro	1,081	2,938	244,841
TOTAL	10,744	28,882	3,133,196

Departments of ¹ Beni, ² Pando, ³ Chuquisaca

100,000 population for the 9 capital cities studied and for both sexes. In the capital cities, mortality from circulatory diseases prevailed, especially among women, with the exception of Trinidad and Cobija, where the rates were higher for men. Men, in general, were exposed to higher risks of death due to communicable diseases, with the exception of Tarija. The risk of death from neoplasm was three times greater in the highland cities of La Paz and Oruro than in the Tarija

Table 5: Proportional mortality calculated from the data collected for the study, Bolivia, 2000

Causes	TOTAL	MALE	FEMALE
communicable	13.3	13.4	13.2
neoplasms	8.0	5.8	10.4
circulatory	40.1	36.4	44.5
perinatal	5.4	5.9	4.8
external	11.9	16.5	6.7
other causes	21.3	22.0	20.4
TOTAL	100.0	100.0	100.0

Table 6: Estimated general mortality rates (per 1,000 population), calculated from the data collected for the study, Bolivia, 2000

Department	TOTAL	MALE	FEMALE
Bolivia	9.2	9.8	8.6
La Paz	9.4	9.5	9.3
Santa Cruz	6.6	7.4	5.9
Cochabamba	9.5	10.3	8.8
Tarija	7.3	7.8	6.7
Potosi	12.6	12.9	12.3
Trinidad ¹	9.1	10.1	8.1
Cobija ²	13.0	15.7	10.7
Sucre ³	11.0	11.5	10.5
Oruro	12.0	12.6	11.4

Departments of ¹ Beni, ² Pando, ³ Chuquisaca

valley and was consistently higher for women, except in Sucre. On the other hand, mortality from external causes was greater in men. The city of Cobija, with an important agroindustrial population (chestnuts, rubber, and gold) and the cities of La Paz, Oruro and Potosí, with intense industrial and mining activities, presented the highest rates of mortality from external causes.

The 2000 mortality study presented here was an attempt to show an up-to-date mortality profile in Bolivia, to support

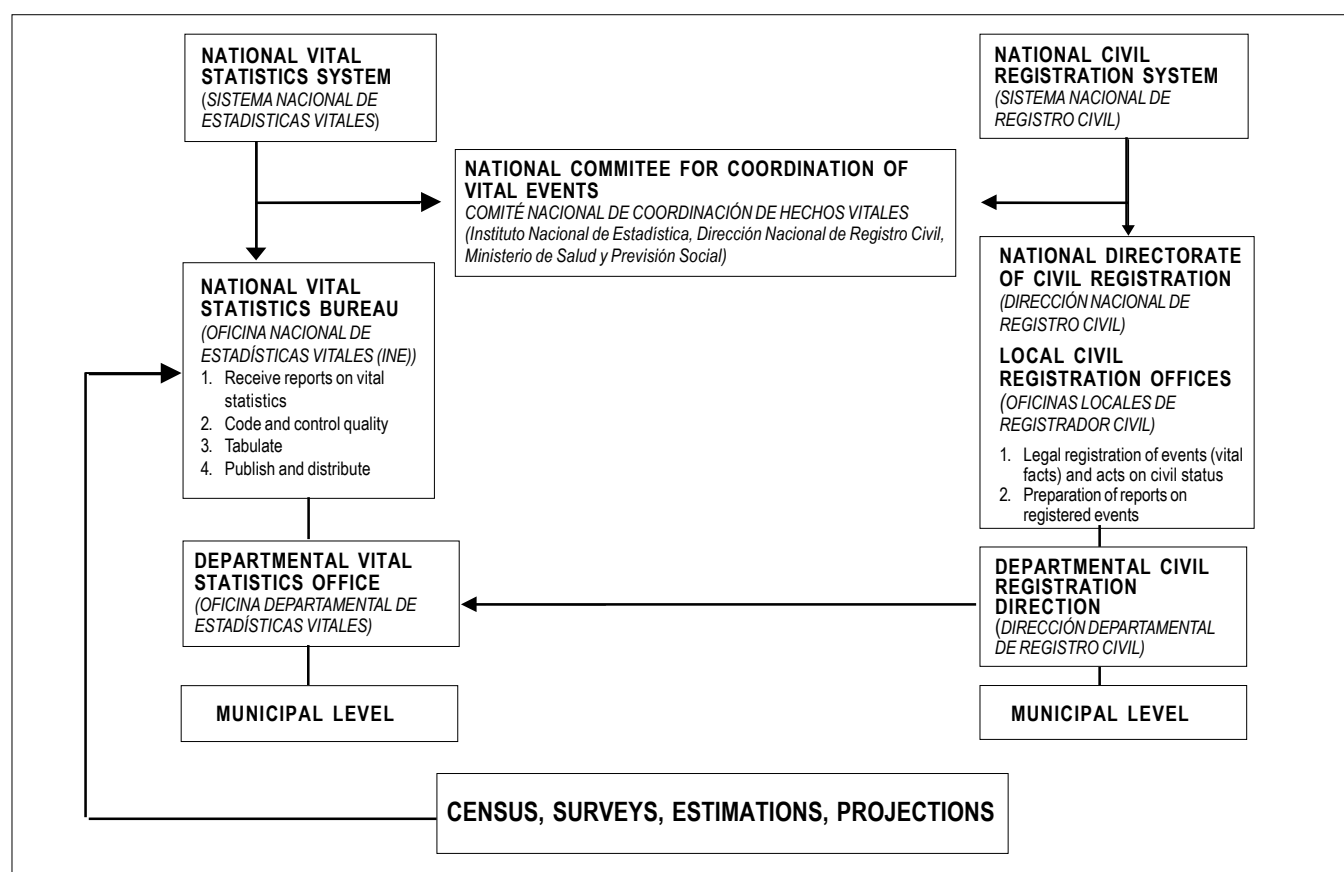
the process of the development and implementation of the National Vital Statistics Information System. Vital statistics should present characteristics of continuity and stability, be compulsory, and provide for complete coverage. Within the organizational framework of the State's institutions, data related to vital events (birth or death) are solely and officially registered in a single entity, the National Civil Registration System. From the Supreme Decree No. 24247 of the Bolivian National Coordination Committee for Information of Regis-

Table 7: Mortality rates from communicable diseases, malignant neoplasms, diseases of the circulatory system and external causes, by capital city and by sex (per 100,000 population), calculated from data collected for the study, Bolivia, 2000

	Communicable			Neoplasms			Circulatory			External		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
BOLIVIA	122.6	132.0	113.3	73.5	57.4	89.7	370.3	358.2	382.6	109.7	161.8	58.1
La Paz	115.3	118.4	111.9	122.9	84.1	162.7	235.6	205.3	266.7	136.1	180.4	90.2
Santa Cruz	129.8	147.3	112.3	65.4	58.4	72.4	218.8	225.2	212.5	74.2	115.8	32.5
Cochabamba	108.1	124.2	92.5	75.6	57.8	92.5	399.2	376.4	420.2	112.3	158.7	67.9
Tarija	59.2	56.1	62.3	32.3	24.1	40.6	433.2	422.3	444.4	61.9	101.6	21.7
Potosi	197.6	199.4	194.6	70.9	36.6	108.6	455.3	398.8	515.8	148.2	227.9	58.8
Trinidad ¹	176.3	196.3	156.3	47.8	23.8	72.1	487.0	571.0	402.7	59.8	59.5	60.1
Cobija ²	241.2	247.8	235.1	111.3	41.3	167.9	556.5	660.7	470.2	241.2	495.5	33.6
Sucre ³	87.8	91.2	84.6	46.5	49.5	43.6	607.0	573.0	640.5	113.7	169.3	58.9
Oruro	163.1	162.0	164.1	108.0	75.3	141.0	388.2	385.6	390.7	175.7	241.9	108.7

Departments of ¹ Beni, ² Pando, ³ Chuquisaca

Figure 2: Vital Statistics System based on the Civil Registration System



tered Vital Events, “the Civil Registry consists of the legal and compulsory registration of vital events, in a continuous and permanent way. Accordingly, the civil registry has a legal and statistical function in the collection of information.”¹⁰ Furthermore, this civil registry serves for the study of inequalities in mortality and for epidemiological analyses in public health. The diagram in figure 2 summarizes the ideal organization of a national vital statistics system based on the civil registration system, which has been chosen to be implemented in Bolivia in the near future.

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Source: Prepared by Dr. Alfredo Calvo Ayaviri from the Special Program for Health Analysis (SHA), PAHO/WHO Representation in Bolivia.

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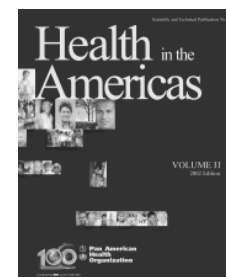
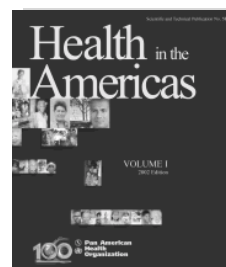
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The Global Youth Tobacco Survey: Results in the Americas

Introduction

The Global Youth Tobacco Survey (GYTS) was developed by the Tobacco Free Initiative of the World Health Organization (WHO), in collaboration with the Office on Smoking and Health (OSH) of the United States' Centers for Disease Control and Prevention (CDC). The Pan American Health Organization has assisted in the survey's application in Latin America and the English-speaking Caribbean.

The objectives of this survey are to measure the prevalence of tobacco use, exposure to environmental tobacco smoke, knowledge and attitudes, and factors that make youth susceptible to tobacco use. During 1999, 2000, and 2001, information was gathered from 23 countries within the Americas (12 from the Caribbean, 10 from Latin America, and the United States). In some of these countries, data were obtained from different geographical aggregation levels, which explains why the following analysis is based on results from 33 areas.

The methodology used for the survey is presented in the following web site: http://www.cdc.gov/tobacco/global/gyts/GYTS_intro.htm, and may also be found in the *Epidemiological Bulletin* 2001;22(2):12-14. A description of the current state of execution may be consulted in the following web page: http://www.cdc.gov/tobacco/global/gyts/GYTS_factsheets.htm. Some results of the survey in the Region of the Americas are presented below.

In some countries, 40% of adolescents smoke

Nearly 40% of the young people surveyed smoke regularly in Chile, which is the country with the highest prevalence of smoking among adolescents 13 to 15 years old. In 19 of the 33 areas surveyed, more than 20% of adolescents currently smoke, too high a proportion for an age group (13-15 years) at which tobacco consumption barely starts. After the Southern Cone, the Andean Area presents the second highest smoking prevalence, followed by the United States, Costa Rica, Mexico, the Latin Caribbean and the English-speaking Caribbean (Table 1).

Adolescents who do not currently smoke but who say they will probably initiate tobacco consumption shortly should be added to those who currently smoke. In some areas of the Andean Area and the Southern Cone, at least one fourth of young non smokers intends to start smoking soon, while in the Caribbean a little more than one tenth of young people intends to follow the steps of their Latin American counterparts. In the majority of the areas surveyed (20 out of 31 with information available), at least 1 out of 6 adolescents who currently do not smoke said they intend to start some time during the following year. Both current smok-

ers and those who intend to begin smoking soon could become experimental smokers who will quit smoking once they pass adolescence. However, the data on those who attempt to quit smoking are not very encouraging.

More than half have attempted to quit smoking without success

In 27 of the 30 areas with available data, more than half the young smokers want to quit smoking. In some areas of the Southern Cone, somewhat less than half want to stop smoking. However, the results show that in some areas of the Andean Area and in the Caribbean in general, 3 out of 4 young smokers want to quit smoking (Table 2).

In all the countries and areas surveyed, more than half of the adolescents who smoke have attempted to quit smoking over the last year unsuccessfully. This is one further evidence of the addictive power of tobacco, even among people with a short history of smoking. In addition, the proportion of smokers who have attempted to quit smoking vary by subregion. In some areas of Peru and the Caribbean, around three quarters of young smokers have attempted to quit, while this proportion is reduced to less than 60% in the United States, Mexico, and most of the Southern Cone.

The reasons for a youth to start or quit smoking are complex. Between 10 and 35% of those surveyed declare that they believe smokers have more friends (this figure is slightly reduced in the case of young women). Nevertheless, the scientific literature has demonstrated that a powerful factor in smoking initiation is the influence of both direct and indirect promotion of tobacco products.

Adolescents are massively subjected to tobacco advertising

Logically enough, countries with higher prevalence of young smokers are those where adolescents are more exposed to the influence of direct publicity both on billboards and in written media. In the Southern Cone, almost 9 out of 10 youths are exposed to tobacco promotion on billboards and 8 out of 10 to advertisements in printed publications. A similar situation exists in Bolivia, Costa Rica, and Mexico. It is also the same in the United States, although the data are only available for messages in the written media. The situation of young people in the rest of the countries of the Americas is not much better. In all these countries, at least half of young people 13 to 15 years of age are exposed to direct publicity by tobacco companies.

These data show that adolescents are massively subjected to publicity and promotion on the part of the tobacco industry. Even assuming that this industry does not deliber-

Table 1: Prevalence (%) of smoking, access, and exposure to environmental smoke among young people 13 to 15 years in the Americas

	Currently smoke	Will start smoking next year	Buy tobacco in a store	Are not rejected from stores because of their age	Exposed to second-hand smoke at home	Would ban smoking in public places	Year of the survey
Andean Area							
Bolivia, Cochabamba	27.3	25.8	58.9	82.7	43.3	79.3	2000
Bolivia, La Paz	31.3	28.0	60.6	81.5	40.3	79.4	2000
Bolivia, Santacruz	29.7	24.1	46.1	83.9	56.3	80.3	2000
Peru, Huancayo	20.9	31.4	58.8	85.4	22.8	89.3	2000
Peru, Lima	23.4	24.4	65.7	74.2	31.1	88.1	2000
Peru, Trujillo	21.4	25.9	64.0	87.0	28.1	90.3	2000
Peru, Tarapoto	18.7	20.1	52.8	75.2	34.2	89.2	2000
Venezuela	14.2	11.6	45.3	88.7	42.4	86.2	1999
Southern Cone							
Argentina, Buenos Aires	32.8	25.1	63.6	93.0	69.6	67.5	2000
Chile, Coquimbo	39.5	27.5	61.0	91.1	53.6	74.6	2000
Chile, Santiago	38.7	28.4	60.2	88.1	61.3	70.7	2000
Chile, Valparaiso	36.8	21.9	55.1	84.5	57.3	76.4	2000
Uruguay, Maldonado	24.6	18.9	55.8	80.8	62.4	76.9	2001
Uruguay, Montevideo	28.1	23.0	67.7	77.7	64.6	74.2	2001
Uruguay, Rivera	23.6	16.8	56.4	91.4	65.3	81.6	2001
Uruguay, Colonia	19.1	19.4	62.8	90.3	57.9	79.5	2001
Central America							
Costa Rica	22.6	18.8	35.1	73.7	33.5	83.7	1999
Mexico							
Mexico, Monterrey	21.9	25.0	58.1	65.2	46.3	77.8	2000
Latin Caribbean							
Cuba	17.6	11.9	41.8	88.0	67.6	80.5	2001
Haiti	18.5	22.3	28.1	70.2	32.8	70.6	2001
Caribbean							
Antigua and Barbuda	13.5	8.6	13.5	*	18.6	73.2	2000
Bahamas	18.6	15.8	21.6	*	28.9	63.9	2000
Barbados	17.6	17.1	19.9	*	22.9	78.5	1999
Dominica	20.5	*	25.2	82.4	28.1	73.1	2000
Grenada	16.4	11.3	18.2	79.5	29.8	72.1	2000
Guyana	16.9	14.2	28.2	*	34.3	75.1	2000
Jamaica	19	14.8	34.6	76.3	30.8	70.8	2001
Montserrat	13.9	12.8	*	*	20.1	88.5	2000
Saint Vincent	24.2	12.8	13.8	49.0	32.5	71.0	2001
Saint Lucia	14.3	13.0	14.1	*	27.4	79.5	2000
Suriname	20.5	18.8	42.5	90.4	57.2	85.9	2000
Trinidad and Tobago	16.3	12.4	31.9	81.5	38.0	83.9	2000
North America							
United States	23.1	*	9.6	61.2	42.1	*	2000

* Data not available

ately seek to target them, the data indicate the difficulty of excluding young people from the audiences to which the publicity is directed. As a result, measures that only allow publicity directed to adults are inherently ineffective in protecting youth. However, the data contributed by this survey makes it clear that the tobacco industry actively tries to target adolescents. Despite their own standards against this type of business practice, between 10 and 20% of the under 16 have received free cigarette offers from industry representatives in most of the countries of the Americas. It is important to point out that in Montevideo, 22% of young people have been the subject of this aggressive business practice. Youth in this Uruguayan city are also the most exposed to billboard publicity. As a result of aggressive commercial practices, in most

countries of the Americas at least 1 in 7 youths owns advertising items with the name or logo of a tobacco brand. Most of these items can only be obtained directly from the companies themselves.

Lack of compliance with legislation on minor's access to tobacco in all the countries

The few existing legal restrictions imposed on tobacco companies to protect adolescents from the pressures of the industry are not implemented in many cases. The best example is the selling of tobacco to minors. While in the United States less than 10% of adolescents obtain their cigarettes from stores, in the Southern Cone, Mexico, and the Andean Area this figure exceeds 50%. In Montevideo, almost 70% of

Table 2: Prevalence (%) of knowledge, attitudes, quitting, and exposure to advertisement among young people 13 to 15 years in the Americas

	Believe that smokers have more friends	Want to quit smoking	Attempted to quit during the past year	Saw ads on billboards	Own an item with logotype on it	Were offered free tobacco
Andean Area						
Bolivia, Cochabamba	18.1	56.3	59.8	87.6	17.9	11.6
Bolivia, La Paz	18.2	64.7	66.9	88.2	19.3	13.9
Bolivia, Santacruz	16.9	69.8	63.7	89.4	20.2	11.9
Peru, Huancayo	13.4	75.1	68.0	69.1	12.0	11.7
Peru, Lima	13.4	67.7	63.4	78.3	13.3	9.3
Peru, Trujillo	14.3	78.3	76.5	71.8	11.3	10.0
Peru, Tarapoto	15.1	86.3	80.3	75.5	8.0	9.3
Venezuela	11.7	69.6	69.4	79.6	14.8	10.4
Southern Cone						
Argentina, Buenos Aires	8.6	47.4	51.6	89.8	18.3	10.4
Chile, Coquimbo	18.1	51.7	61.2	83.6	11.3	9.9
Chile, Santiago	17.4	44.3	59.7	88.2	12.2	8.9
Chile, Valparaiso	20.7	50.8	61.3	86.2	11.2	10.3
Uruguay, Maldonado	12.9	58.7	63.6	94.4	16.9	21.8
Uruguay, Montevideo	11.4	52.1	58.2	91.7	18.7	19.8
Uruguay, Rivera	12.8	65.5	60.6	90.4	24.0	19.8
Uruguay, Colonia	10.2	46.0	50.4	89.7	16.3	17.4
Central America						
Costa Rica	18.0	61.9	65.8	91.9	13.4	7.8
Mexico						
Mexico, Monterrey	14.1	54.4	58.5	92.4	25.7	12.1
Latin Caribbean						
Cuba	10.4	58.8	65.6	67.4	13.5	7.5
Haiti	16.9	83.1	81.4	64.1	20.5	11.2
Caribbean						
Antigua and Barbuda	27.2	*	*	73.5	15.0	11.5
Bahamas	35.8	75.2	77.3	63.2	15.3	10.8
Barbados	25.6	50.2	64.6	70.0	14.8	8.3
Dominica	33.4	54.8	52.4	*	21.0	12.2
Grenada	27.0	72.1	69.8	60.2	15.9	12.9
Guyana	27.4	*	*	80.3	17.5	12.6
Jamaica	31.9	73.3	68.1	65.9	13.7	8.6
Montserrat	27.8	*	*	51.5	15.3	13.4
Saint Vincent	29.8	77.8	83.9	65.9	16.7	9.8
Saint Lucia	34.4	75.7	*	65.7	18.0	12.6
Suriname	29.2	75.0	68.3	77.3	22.6	13.8
Trinidad and Tobago	32.2	69.4	76.5	83.6	19.4	11.1
North America						
United States	*	55.8	58.2	*	21.7	*

* Data not available

youths under 16 obtain tobacco from stores. The survey also shows that, except in the Caribbean state of Saint Vincent, more than 60% of young people in all countries are not refused because they are underage when they attempt to purchase tobacco. Countries of the Southern Cone show a particularly high level of permissiveness (in Buenos Aires, more than 93% of underage people are able to purchase tobacco), followed by the Andean Area, with the lowest percentage (61%) in the United States. This figure exceeds 70% in 24 of the 27 areas where this information is available. The results of this survey suggest a very high degree of tolerance toward smoking in adolescents, in addition to a systematic lack of compliance with laws on sales to minors.

The majority of young people involuntarily breath second hand smoke

People who breathe air contaminated by tobacco smoke suffer the same diseases as smokers themselves. Children and young people exposed to second hand smoke have greater probability of suffering, among other diseases, bronchitis, otitis and asthma, which are the leading causes of pediatric consultation in many countries. For this reason, it is troubling that the vast majority of young people are involuntarily exposed to the smoke of others, both at home and in public places. In 25 of the 33 areas surveyed, more than 50% of youths are exposed to tobacco smoke in public places. This percentage is almost 90% in Buenos Aires and 80% in Montevideo, followed by the United States and the Andean area.

At-home exposure to second hand tobacco smoke is cause for special alarm since it often represents the inhalation of large doses of toxic by-products. The subregions of the Americas with the greatest proportion of young people exposed to tobacco smoke at home are in the Southern Cone with 70% in Buenos Aires, followed by the Latin Caribbean, and in last place the English-speaking Caribbean. The detrimental results of second-hand smoking on health and the fact that young people learn from what they see in their family environment make exposure to tobacco smoke in the home a double concern.

The highest proportion of young people who would prohibit tobacco use in public places is in the Andean Area with 90% in Trujillo, Peru, followed by Costa Rica. It should be noted that in 30 out of the 32 remaining regions with available data, more than 70% of the surveyed young people would prohibit smoking in public places. There seems to be a large consensus in favor of the prohibition of smoking in public places by adolescent, both smokers and non smokers.

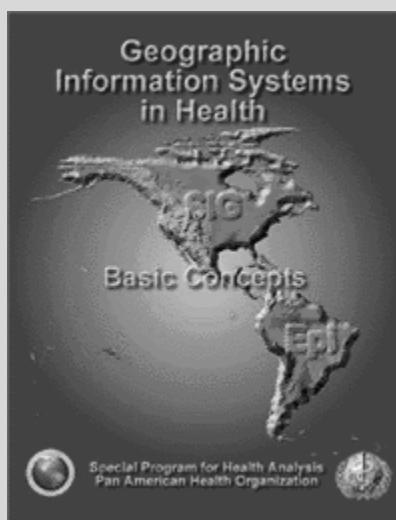
Conclusions

The results of the GYTS in the Americas give a troubling panorama of the situation. The prevalence of regular tobacco use is high in many countries and the majority of those who

do not smoke are exposed to second hand smoke. In addition, the majority of young people are subject to constant pressures to initiate or to keep smoking. In light of this situation, in September 2001, PAHO's Directing Council called upon the countries of the Americas to act upon preventing the initiation of tobacco use, and promoting cessation, especially in light of the vulnerability of children and adolescents. This requires the implementation and enforcement of cost-effective measures to reduce tobacco use, among them the increase of tobacco taxes at levels that reduce consumption and the progressive elimination of the promotion of tobacco products, within the constraints of national Constitutions. On the other hand, the Directing Council also urged Member States to protect all non-smokers, in particular children and pregnant women, from exposure to second hand tobacco smoke through the immediate creation of smoke free environments in government buildings, health care facilities, and educational institutions. It also asked for the timely creation of smoke free environments in the workplace and in public places. Smoke free environments also promote the cessation of tobacco use and reduce the risk of smoking initiation.

Source: Prepared by Dr. Jaime Pérez Martín and Dr. Armando Peruga from the Mental Health Program (HPM) of PAHO's Division of Health Promotion and Protection (HPP).

Geographic Information System in Health: Basic Concepts



The textbook "**Geographic Information Systems in Health, Basic Concepts**" was prepared by the Special Program for Health Analysis (SHA) of the Pan American Health Organization (PAHO/WHO), in conjunction with the Collaborating Groups on SIG-Epi in Chile, Cuba and Mexico. The objective of this book is to provide end-users (epidemiologists, health services managers, decision-makers, researchers and other public health workers) with some basic concepts of three related disciplines, Epidemiology, Geography and Informatics, which are considered essential for the appropriate use of Geographic Information Systems in Health. The book also includes real life examples on diverse areas of application, from health situation analysis to public health surveillance, unmet health needs assessment, priority setting and risk analysis to planning and programming of health services and evaluation of public health interventions. It is organized in three chapters, each containing a glossary of selected terms.

The first chapter (**Geographic Information Systems Applied to Epidemiology**) presents the methods and uses of epidemiology as they relate to the development and application of GIS in public health.

Chapter Two (**Cartography, Geographic Information Systems, and Spatial Analysis**) discusses basic geographic concepts, cartography, and aerial photography, in relation to GIS concepts and health situation analysis.

The third chapter (**Relational Database Systems in Geographic Information Systems**) introduces basic concepts of relational database systems and structured query language, including some of their applications to epidemiology.

The book is available upon request in English and Portuguese from: Special Program for Health Analysis, Pan American Health Organization, 525 23rd St., NW, Washington, DC 20037 or email: sha@paho.org. The Spanish version is available through the PALTEX Program (http://www.paho.org/Spanish/PAHEF/PALTEX/paltex_home.htm) at a price of US\$16.00.

A Glossary for Social Epidemiology

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PART II

Race/ethnicity and racism

Race/ethnicity is a social, not biological, category, referring to social groups, often sharing cultural heritage and ancestry, that are forged by oppressive systems of race relations, justified by ideology, in which one group benefits from dominating other groups, and defines itself and others through this domination and the possession of selective and arbitrary physical characteristics (for example, skin colour).^{6,13} *Racism* refers to institutional and individual practices that create and reinforce oppressive systems of race relations (see “discrimination”, above).^{6,15,41} *Ethnicity*, a construct originally intended to discriminate between “innately” different groups allegedly belonging to the same overall “race”,^{42,43} is now held by some to refer to groups allegedly distinguishable on the basis of “culture”⁴⁴; in practice, however, “ethnicity” cannot meaningfully be disentangled from “race” in societies with inequitable race relations, hence the construct “race/ethnicity”.^{6,42}

Two diametrically opposed constructs are thus relevant to understanding research on and explaining racial/ethnic disparities in health.^{6,45} The first is: *racialised expressions of biology*, whereby measured average biological differences between members of diverse racial/ethnic groups are assumed to reflect innate, genetically determined differences (premised, in the first instance, on the arbitrary phenotypic characteristics seized upon to define, tautologically, racial categories). The second is: *biological expressions of racism* (see “biological expressions of social inequality”, above). For example, following dominant ideas construing “race” as an innate biological characteristic, epidemiological research has been rife with studies attempting to explain racial/ethnic disparities in health in relation to presumed genetic differences, absent consideration of effects of racism on health.^{6,45–46,47} Alternatively, considering lived experiences of racism as real but the construct of biological “race” as spurious, social epidemiological research investigates health consequences of economic and non-economic expressions of racial discrimination.^{6,13,45–48}

Sexualities and heterosexism

Sexuality refers to culture bound conventions, roles, and behaviours involving expressions of sexual desire, power, and diverse emotions, mediated by gender and other aspects of social position (for example, class, race/ethnicity, etc).⁴⁹ Distinct components of sexuality include: sexual identity, sexual behaviour, and sexual desire. Contemporary “Western” categories by which people self identify or can be labelled include: heterosexual, homosexual, lesbian, gay, bisexual, “queer”, transgendered, transsexual, and asexual. *Heterosexism*, the type of discrimination related to sexuality, con-

stitutes one form of abrogation of sexual rights⁵⁰ and refers to institutional and interpersonal practices whereby heterosexuals accrue privileges (for example, legal right to marry and to have sexual partners of the “other” sex) and discriminate against people who have or desire same sex sexual partners, and justify these practices via ideologies of innate superiority, difference, or deviance. Lived experiences of sexuality accordingly can affect health by pathways involving not only sexual contact (for example, spread of sexually transmitted disease) but also discrimination and material conditions of family and household life.^{49,50}

Society, social, societal, and culture

Society, originally meaning “companionship or fellowship”, now stands as “our most general term for the body of institutions and relationships within which a relatively large group of people live and as our most abstract term for the condition in which such institutions and relationships are formed”.⁵¹ *Social*, as an adjective, likewise has complex meanings: “as a descriptive term for *society* in its now predominant sense of the system of common life”, and also as “an emphatic and distinguishing term, explicitly contrasted with *individual* and especially *individualist* theories of society” [italics in the original].⁵¹ *Societal*, in turn, serves as a “more neutral reference to general *social* formations and institutions”.⁵¹

By this logic, *social epidemiology* and its social theories of disease distribution stand in contrast to *individualistic epidemiology*, which relies on individualistic theories of disease causation (see “theories of disease distribution”, below).

Culture, originally a “noun of process” referring to “the tending of something, basically crops or animals”,⁵¹ presently has three distinct meanings: “(i) the independent and abstract noun which describes a general process of intellectual, spiritual, and aesthetic development . . . ; (ii) the independent noun, whether used generally or specifically, which indicates a particular way of life, whether of a people, a period, a group, or humanity in general; and . . . (iii) the independent and abstract noun which describes the work and practices of intellectual and especially artistic activity”.⁵¹ In social epidemiology, meaning (ii) predominates, with “culture” typically conceptualised and operationalised in relation to health related beliefs and practices, especially dietary practices. By this logic, “acculturation” (or, perhaps more accurately “de-culturation”⁴⁵) refers to members of one “culture” adopting beliefs and practices of another (and typically dominant) “culture”.^{52,53} Related, examples abound^{44,53} in epidemiological literature whereby the construct of “culture” is conflated with “ethnicity” (and “race”) and together are inappropriately invoked to explain socioeconomic and health characteristics of

diverse population groups on the basis of “innate” qualities, rather than as a consequence of inequitable social relationships between groups.⁵²

Social class and socioeconomic position

Social class refers to social groups arising from interdependent economic relationships among people.^{51, 54–56} These relationships are determined by a society’s forms of property, ownership, and labour, and their connections through production, distribution, and consumption of goods, services, and information. Social class is thus premised upon people’s structural location within the economy—as employers, employees, self employed, and unemployed (in both the formal and informal sector), and as owners, or not, of capital, land, or other forms of economic investments. Stated simply, classes—like the working class, business owners, and their managerial class—exist in relationship to and co-define each other. One cannot, for example, be an employee if one does not have an employer and this distinction—between employee and employer—is not about whether one has more or less of a particular attribute, but concerns one’s relationship to work and to others through a society’s economic structure.

Class, as such, is not an a priori property of individual human beings, but is a social relationship created by societies. As such, social class is logically and materially prior to its expression in distributions of occupations, income, wealth, education, and social status. One additional and central component of class relations entails an asymmetry of economic exploitation, whereby owners of resources (for example, capital) gain economically from the labour or effort of non-owners who work for them.

Socioeconomic position, in turn, is an aggregate concept that includes both resource-based and prestige-based measures, as linked to both childhood and adult social class position.^{54–56} Resource-based measures refer to material and social resources and assets, including income, wealth, and educational credentials; terms used to describe inadequate resources include “poverty” and “deprivation” (see “poverty”, above). Prestige-based measures refer to individuals’ rank or status in a social hierarchy, typically evaluated with reference to people’s access to and consumption of goods, services, and knowledge, as linked to their occupational prestige, income, and educational level. Given distinctions between resource-based and prestige-based aspects of socioeconomic position and the diverse pathways by which they affect health, epidemiological studies should state clearly how measures of socioeconomic position are conceptualised. The term “socioeconomic status” should be eschewed because it arbitrarily (if not intentionally) privileges “status”—over material resources—as the key determinant of socioeconomic position.⁵⁴

Social determinants of health

Social determinants of health refer to both specific features of and pathways by which societal conditions affect health and that potentially can be altered by informed action.^{4, 24, 57} As determinants, these social processes and conditions are

conceptualised as “essential factors” that “set certain limits or exert pressures”, albeit without necessarily being “deterministic” in the sense of “fatalistic determinism”.⁵¹ Historically contingent, social determinants of health, broadly writ, include:

(a) a society’s past and present economic, political, and legal systems, its material and technological resources, and its adherence to norms and practices consistent with international human rights norms and standards; and

(b) its external political and economic relationships to other countries, as implemented through interactions among governments, international political and economic organisations (for example, United Nations, World Bank, International Monetary Fund), and non-governmental organisations.

One term appearing in social epidemiological literature to summarise social determinants of health is “social environment”.^{4, 7, 57} This metaphor invokes notions of “environment”, a term literally referring to “surroundings” and initially used to denote the physical, including both “natural” and “built”, environment. Both “social environment” and the related metaphor “social ecology” are problematic in that they can conceal the role of human agency in creating social conditions that constitute social determinants of health.¹

Social inequality or inequity in health and social equity in health

Social inequalities (or inequities) in health refer to health disparities, within and between countries, that are judged to be unfair, unjust, avoidable, and unnecessary (meaning: are neither inevitable nor unremediable) and that systematically burden populations rendered vulnerable by underlying social structures and political, economic, and legal institutions.^{21, 58, 59} As such, social inequalities (or inequities) in health are not synonymous with “health inequalities”, as this latter term can be interpreted to refer to any difference and not specifically to unjust disparities.^{58, 59} For example, recently proposed measures of “health inequalities” deliberately quantify distributions of health in populations without reference to either social groups and or social inequalities in health.^{59–62}

Social equity in health, in turn, refers to an absence of unjust health disparities between social groups, within and between countries.⁵⁸ Promoting equity and diminishing inequity requires not only a “process of continual equalization” but also a “process of abolishing or diminishing privileges”.⁵¹ Thus, pursuing social equity in health entails reducing excess burden of ill health among groups most harmed by social inequities in health, thereby minimising social inequalities in health and improving average levels of health overall.²¹

Social production of disease/political economy of health

Social production of disease/political economy of health refers to related (if not identical) theoretical frameworks that explicitly address economic and political determinants of health and distributions of disease within and across societ-

ies, including structural barriers to people living healthy lives.^{1, 63–66} These theories accordingly focus on economic and political institutions and decisions that create, enforce, and perpetuate economic and social privilege and inequality, which they conceptualise as root—or “fundamental”⁶⁷—causes of social inequalities in health. Although compatible with the ecosocial theory of disease distribution, they differ in that they do not systematically seek to integrate biological constructs into explanations of social patternings of health.^{1, 2}

Social production of scientific knowledge

Social production of scientific knowledge refers to ways in which social institutions and beliefs affect recruitment, training, practice, and funding of scientists, thereby shaping what questions we, as scientists, do and do not ask, the studies we do and do not conduct, and the ways in which we analyse and interpret data, consider their likely flaws, and disseminate results.^{68–71}

That scientists’ ideas are shaped, in part, by dominant social beliefs of their times is well documented.^{3, 72–74} Relevant to social epidemiology, a substantial body of literature demonstrates how scientific knowledge and, more importantly, real people, have been harmed by scientific racism, sexism and other related ideologies, including eugenics, which justify discrimination and discount the importance of understanding and ameliorating social inequalities in health.⁶ Tellingly, as of the year 2000, only 0.05% of the approximately 34 000 articles indexed in Medline by the keyword “race” had explicitly investigated racial discrimination as a determinant of population health.⁶

Stress

Stress, a term widely used in the biological, physical, and social sciences, is a construct whose meaning in health research is variously defined in relationship to “stressful events, responses, and individual appraisals of situations”.⁷⁵ Common to these definitions is “an interest in the process in which *environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological or biological changes that may place persons at risk for disease*” [italics in original].⁷⁵ An “environmental stress perspective” focuses on “environmental demands, stressors, or events”⁷⁵; a “psychological stress perspective”, on “an *organism’s perception and evaluation* of the potential harm posed by objective environmental exposures”⁷⁵; a “biological stress perspective”, on “activation of the physiological systems that are particularly responsive to physical and psychological demands”.⁷⁵ Whether social epidemiological research conceptualises stress in relation to structural, interpersonal, cognitive, or biological parameters, and whether it uses “environment” as a term or metaphor that reveals or conceals the role of human agency and accountability in determining distributions of “stress”, depends on the underlying theories of disease distribution guiding the research (see “theories of disease distribution” below, and “social determinants”, above).

Theories of disease distribution

Theories of disease distribution seek to explain current and changing population patterns of disease across time and space and, in the case of social epidemiology, across social groups (within and across countries, over time).¹ Using—like any theory^{51, 71}—interrelated sets of ideas whose lausibility can be tested by human action and thought, theories of disease distribution presume but cannot be reduced to mechanism oriented theories of disease causation.¹ Explicit attention to aetiological theory is essential, because shared observations of social disparities in health do not necessarily translate to common understandings of causes.¹ Excess risk of HIV/AIDS among poor women of colour, for example, is attributed to social inequity by ecosocial and social production of disease theories of disease distribution, but is attributed to “bad behaviours” by biomedical lifestyle theories of disease causation.^{1, 76}

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Case Definition

Acute Viral Hepatitis

Rationale for surveillance

Estimates suggest that worldwide, there are 385 million carriers of hepatitis B virus and 170 million carriers of hepatitis C virus. More than 1 million deaths each year are attributable to hepatitis B. Transmission is mainly oral-faecal for hepatitis A and E, percutaneous for hepatitis B, C, and D and sexual for hepatitis B. The course of the disease may be fulminating (e.g., hepatitis E in pregnancy); chronic infection and severe sequelae occur for hepatitis B, C, and D. Prevention measures include transfusion safety, safe and appropriate use of injections, promotion of safe sexual practices, and (for hepatitis A and hepatitis B) immunization. Hepatitis B is targeted by WHO for reduced incidence/prevalence, by means of vaccination programs in children under 1 year of age.

Recommended case definition

Clinical description

Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness. Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.

Note: Most infections are asymptomatic in early childhood. A variable proportion of adult infections is asymptomatic.

Laboratory criteria for etiological diagnosis

- Hepatitis A: IgM anti-HAV positive
- Hepatitis B: IgM anti-HBc positive with or without HBsAg
- Non-A, non-B: IgM anti-HAV and IgM anti-HBc negative

Note 1: The anti-HBc IgM test, specific for acute infection, is not available in most countries. HbsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

Note 2: For patients negative for hepatitis A or B, further testing for a diagnosis of acute hepatitis C, D, and/or E is recommended:

- Hepatitis C: anti-HCV positive with compatible clinical-epidemiological data
- Hepatitis D: HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)
- Hepatitis E: IgM anti-HEV positive

Case classification

Suspected: A case that is compatible with the clinical description.

Probable: Not applicable.

Confirmed: A suspected case that is laboratory confirmed or,

for hepatitis A only, a case compatible with the clinical description, in a person who has an epidemiological link with a laboratory-confirmed case of hepatitis A (i.e. household contact with an infected person during the 15-50 days before the onset of symptoms).

Recommended types of surveillance

- Routine monthly reporting of aggregated data of suspected cases, and if available, the number of confirmed cases of each type of hepatitis, from the peripheral level to intermediate and central levels
- Zero reporting required at all levels
- When countrywide surveillance is not possible, surveillance in sentinel areas or hospitals may provide useful information on potential sources of infection

All outbreaks should be investigated immediately and confirmed serologically.

Recommended minimum data elements

Aggregated data:

- Number of third doses of hepatitis B vaccine (HepB3) administered to infants (less than 1 year)
- Number of injections received in the 6 weeks to 6 months preceding symptoms of acute hepatitis (whatever the etiology)
- Number of suspect cases
- If available, number of confirmed cases for each type of hepatitis

Recommended data analyses, presentation, reports: (from multiple sources, in addition to surveillance data)

- HepB3 coverage in infants (less than 1 year) by year and geographic area.
- Incidence of acute viral hepatitis by year, month, geographical area, and (if data exist) by age group and type of virus.
- Proportion of all cases of chronic liver disease, cirrhosis, and primary liver cancer that are HbsAg positive or anti-HCV positive (see special aspects).
- Comparing the proportion of patients who received an injection in the 6 weeks to 6 months preceding symptoms among hepatitis A and hepatitis B cases helps to estimate the proportion of hepatitis B virus infections that are attributable to injections.

Principal uses of data for decision-making

- Monitor HepB3 immunization coverage by geographic area to measure areas with weak performance and take action.
- Investigate all suspected / reported outbreaks.

- Determine the specific cause of acute viral hepatitis cases (reported routinely or during outbreaks), so that corrective measures can be taken.
- Evaluate the effectiveness of injection safety programmes.
- Measure the proportion of acute viral hepatitis, chronic liver disease, cirrhosis, and primary liver cancer that are hepatitis B virus or hepatitis C virus carriers to:
 - Determine the burden of the disease in the population;
 - Prioritize among other diseases of public health importance; and
 - Choose the proper strategies for control.

Special aspects

Accurate differential diagnosis of viral hepatitis types requires serological testing – unavailable in many developing countries. In developing countries where most infections occur asymptotically, a low incidence of reported acute viral hepatitis disease should not be misinterpreted as a low incidence of viral hepatitis infection.

Understanding the epidemiology and impact of viral hepatitis requires enhanced surveillance and an understanding of the sequelae of hepatitis B, C and D virus infection, such as

asymptomatic chronic infection, chronic hepatitis, cirrhosis, and primary liver cancer. This also requires data collection from sources not routinely used, including hospital surveillance data such as hospital discharges, and mortality (chronic hepatitis, cirrhosis, liver cancer) and cancer registers. Special sero-prevalence surveys may be needed to measure prevalence of hepatitis B and C infection in the general population and in special groups (health care workers, blood donors, pregnant women, military recruits, patients with liver disease, people on dialysis, haemophiliacs), and ethnic sub-populations.

Assessment for coverage of hepatitis B vaccine is similar to that for other vaccines. Hepatitis vaccine is given to infants (less than one year) (and in some industrial countries to adolescents), and to special groups such as health workers, primarily to prevent the development of chronic liver disease and liver cancer. Serological testing to document sero-conversion in children is usually not necessary: studies show that vaccine is 85% to 100% effective in preventing chronic infection.

Source: Adapted from “WHO Recommended Surveillance Standards, Second edition, October 1999”, WHO/CDS/CSR/ISR/99.2

Leprosy (Hansen’s disease)

Rationale for surveillance

Leprosy continues to affect a large number of people. In 1997 there were an estimated 1.5 million cases in the world. Control of the disease has improved with the introduction of multi-drug therapy (MDT). WHO has targeted the disease for **elimination** (<1 case/10 000 population) by the year 2000, using a focused flexible approach. This includes making multidrug therapy available to all communities and areas, appropriate and good quality diagnosis and treatment, with evaluation through epidemiological surveillance and programme monitoring.

Recommended case definition

Clinical description

The clinical manifestations of the disease vary in a continuous spectrum between the two polar forms, lepromatous and tuberculoid leprosy:

- In lepromatous (multibacillary) leprosy, nodules, papules, macules and diffuse infiltrations are bilateral symmetrical and usually numerous and extensive; involvement of the nasal mucosa may lead to crusting, obstructed breathing and epistaxis; ocular involvement leads to iritis and keratitis.
- In tuberculoid (paucibacillary) leprosy, skin lesions are single or few, sharply demarcated, anaesthetic or hypoaesthetic, and bilateral asymmetrical, involvement of peripheral nerves tends to be severe.

- Borderline leprosy has features of both polar forms and is more labile.
- Indeterminate leprosy is characterized by hypopigmented maculae with ill-defined borders; if untreated, it may progress to tuberculoid, borderline or lepromatous disease.

Laboratory criteria for confirmation

Alcohol-acid-fast bacilli in skin smears (made by the scrape-incision method).

In the paucibacillary form the bacilli may be so few that they are not demonstrable. In view of the increasing prevalence of HIV and hepatitis B infection in many countries where leprosy remains endemic, the number of skin smear sites and the frequency of smear collection should be limited to the minimum necessary.

Case classification

WHO operational definition:

A case of leprosy is defined as a person showing one or more of the following features, and who as yet has to complete a full course of treatment:

- hypopigmented or reddish skin lesions with definite loss of sensation
- involvement of the peripheral nerves, as demonstrated by definite thickening with loss of sensation
- skin smear positive for acid-fast bacilli

Classification (microbiological):

Paucibacillary (PB): includes all smear-negative cases.

Multibacillary (MB): includes all smear-positive cases.

Classification (clinical):

Paucibacillary single lesion leprosy: 1 skin lesion.

Paucibacillary leprosy: 2 to 5 patches or lesions on the skin.

Multibacillary leprosy: >5 patches or lesions on the skin.

Recommended types of surveillance

Individual patient records at peripheral level for investigation and case-management.

Routine monthly reporting of aggregated data of all cases from periphery to intermediate level and from intermediate to central level.

International: Quarterly and annual reporting of aggregated data from central level to WHO.

Recommended minimum data elements

Individual patient records

Unique identifier, name, sex, age, geographical information, disability grade, laboratory examination, disease classification (multi- or paucibacillary, see case definition), date treatment commenced, treatment outcome (disability, cured, drop-out), contacts.

Aggregated data for reporting – essential indicators (endemic countries):

- Number of cases registered for treatment at a given time (usually end of year)
- Number of newly detected cases by type of leprosy
- Number of cases treated with multidrug therapy (MDT)
- Number of WHO grade 2 disability* among new cases
- Number of patients cured with MDT
- Number of relapses

*See: *WHO technical Reports Series N°874*, Geneva: World Health Organization, 1988: 31-32

Multidrug treatment (MDT) indicators (see special aspects)

MDT supply indicators:

For MB adult cases, MB child cases, PB adult cases, PB child cases:

- Number of patients under treatment
- Blister pack utilization (%)

Recommended data analyses, presentation, reports

Point prevalence, annual detection, MDT coverage, number of patients cured (wherever possible based on cohort reporting), number of cases registered for chemotherapy at the end of the year divided by the population in which the cases have occurred.

Graphs: Prevalence by year, detection by year, number of patients on multidrug therapy (MDT) by year, number of patients cured with MDT by year.

Maps: Number of registered cases, number of new cases, type of treatment, MDT coverage all by geographical area.

Tables: Prevalence, new case detection, percentage of children, percentage of disabled, percentage multibacillary, number of patients cured with MDT.

Principal uses of data for decision-making

- Assess the magnitude of the problem
- Identify variations in case-detection
- Evaluate the policy of elimination of leprosy
- Plan the distribution of drugs
- Identify technical and operational difficulties faced by the programme
- Identify high risk areas for further targeting intervention
- Evaluate impact of intervention

Special aspects

- Leprosy tends to be underreported. However, there are no reliable cost-effective methods to estimate the real prevalence of the disease accurately.
- In endemic countries, essential indicators must be validated through independent mechanisms in order to assess performance of MDT services and progress towards the elimination of the disease at the local level.

Source: “WHO Recommended Surveillance Standards, Second edition, October 1999”, WHO/CDS/CSR/ISR/99.2

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