Selection and utilization of indicators to measure maternal and child health inequalities in the Latin American (LA) Region

Selección y utilización de indicadores para medir las desigualdades en salud materna e infantil en la Región de América Latina (AL)

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ABSTRACT

Health inequalities are differences in health across population groups defined by socioeconomic, demographic, or geographic factors. The access and availability to public health services for the peoples of the Americas varies in terms of coverage and quality. The MASCOT Consortium defined a set of health and PROGRESS indicators as to perform an initial assessment of the maternal and child health (MCH) in Bolivia, Brazil, Chile, Costa Rica, and México. Methodology: Using a list of the original categories with descriptions set by the World Health Organization (WHO), we had a selection of 13 indicators of MCH, and together with the PROGRESS framework, for summarizing and describing the broad field of health determinants. Data for each country was selected from national and/or international sources as to construct the chosen indicators. Data was filled in matrixes and analyzed.

Results: The results obtained show differences of better health indicators for women and children of educated women and in urban areas. Discussion: Not all countries have needed data available, thus is not possible to compare amongst countries as data varies. Variation in data sources and standardization is a problem in the region; techniques of acquiring it makes it difficult to do so. Available data allowed making a first measurement of selected MCH indicators, as a proposal for measuring advances and impact of MDGs related strategies. If possible, MASCOT will try to perform s comparison in a given interval as new data for the participating countries will soon be available.

Keywords

Health Inequalities, Maternal Welfare, Child Health (Source MeSH NLM)

INTRODUCTION

Health inequalities are differences in health across population groups defined by socioeconomic, demographic, or geographic factors. These inequalities are not produced solely by the accessibility and affordability in health systems, but instead are the product of health determinants, which include social and physical environment, individual behaviors, genetics, and education, as well as social and political process such as migration, conflicts, underemployment, and others. (1)

Currently, as much as inequality problems have been addressed, there is still a gap that can be seen globally. The differences in health between rich and poor have increased in some countries, but improved in others. Even in countries where health inequalities have improved, there is no reason to feel the task is done. Data currently exists on inequalities from all across the globe, but the ways to reduce such inequalities remain a purely internal concern for countries. (2)

The access and availability to public health services for the peoples of the Americas varies in terms of coverage and quality. Sanitary attention in the Latin American (LA) region is free of charge, with some small exceptions. In rural areas and in poorer countries, a suitable infrastructure does not exist. (3). And even though the LA region has reached outstanding advances in improving some basic health indicators in the last decades, the situation of public health services is continuously insufficient in most of these countries. Average data per country or at regional scale that show gradual improvement in maternal mortality, child and infant mortality, hide the fact that within some groups (the poorest, the indigenous and the African Latin American and Caribbean descendants) the sanitary indicators are not improving. Therefore, despite the fact that in general the sanitary situation is improving, we see that meanwhile health inequi-

ties are increasing. This contributes to the increase of differences of health status among groups. (4) This is an example of how social inequity and poverty continue to be the main challenges in the whole LA region. This is supported by the Economic Commission for Latin America (ECLA) report: 'Latin America is the most unequal region of the world'. In 2010 the poverty index was 31.4% which included 12.3% of people in extreme poverty and indigence. (5)

This paper is based on the analysis of five National Reports of a broader mapping study performed under the project called "Multilateral Association for studying health and enhancing north-south and south-south Cooperation" (MASCOT, www.mascotfp7.eu), which is an European Commission funded project under the 7th Framework Program for Research, that aims to stimulate the cooperation between countries from 3 world regions – Europe, Africa and Latin America – in order to identify and implement adequate and efficient country-specific strategies for tackling health inequalities preferentially affecting children, adolescents and mothers.

MASCOT is coordinated by the Council on Health Research for Development (COHRED, www.cohred.org), and the consortium includes partners from 11 countries, plus national experts covering a total of 16 countries, in Europe (England, France, Portugal and Switzerland), Africa (Ghana, Guinea Bissau, Malawi, Mozambique, South Africa, Tanzania and Tunisia) and Latin America (Bolivia, Brazil, Costa Rica, Chile and Mexico). The Consortium recognizes the need of having better coordinating strategies for South-South and North-South collaboration aimed at enhancing regional and local infrastructure, capabilities of research for health, as well as stimulating knowledge transfer and exchange mechanisms between countries for shaping policies, programs and health actions intended to provide better

health and health services. These actions have to be under-stood as a way to reduce inequalities as the end-result of the strengthened collaboration actions.

The project has the following strategic objectives: to describe inequalities concerning maternal and child's health (MCH) and mapping of strategies currently put into practice; to describe National Research for Health Systems (NRHS) and detected dedicated projects and research teams working on MCH ine-qualities; to identify the public health interventions and strate-gies and evaluated their roles in the development of measures that are and/or should be implemented for tackling MCH ine-qualities in others countries; to develop country-specific strate-gies; and to stimulate multi-lateral collaboration and disseminate the results.

In an initial stage, the consortium developed a standard method-ology for assessing the current situation of health research and MCH inequalities in the 16 countries selected and identified rele-vant initiatives in the development of policies and strategies addressing those two aspects. Next step was to identify institu-tions/teams performing research in this area, to detect promising projects and research results as well as strategies, programs and policies implemented to tackle MCH inequalities.

The selected countries in the LA region were: Bolivia, Brazil, Chile, Costa Rica, and México. The selection of these countries was, a) being part of the Consortium, and b) based on the Hu-man Development Index (HDI) to ensure its regional representa-tion. Therefore this paper shows the selection and initial utiliza-tion of indicators and determinants in the registry of maternal and child health inequality, in the hopes other countries find these method applicable to them.

METHODOLOGY

Theoretical Approach

There are various approaches for the study and analysis of the social determinants of health. The theoretical approach known as, eco-social model, described by several authors, such as Nancy Krieger (2001), Marcel Goldberg, (2005), includes the social-economic structure for the analysis of social determinants of health.(6,7) This model manages to unify some components of other theoretical models such as the materialist/ structuralist theory and social production of Health theory (Bonnefoy et al. (2007). Although there are awareness that all the mentioned theories lack a characteristic of absolute, proof-based certainty. What is understood, however, is that there are, in fact, various causes forming an evolving pattern, which affect health. These authors state that what needs to be explained is why the biologi-cal systems in the human change determined by social and biological/ biochemical processes. As stated by them: "This is at the heart of the intellectual challenge of the social determina-tion of health and the corresponding inequities in health." Bonnefoy et al. (2007)

It is needed to consider other argument described by Bonnefoy et al.: "The concepts associated with the social determinants are not universal (for example, class, status and religion, mean different things in different societies). Some caution is required, especially in using concepts originating in high income societies in low and middle income ones. (8)

Determining indicators of maternal and child health (MCH)

Originally, and using a list of the original categories with descrip-tions set by the World Health Organization (WHO), we had a matrix composed of a wide set of possible indicators of maternal and child health that we could use to map inequalities.

Ideally, our matrix would have included a long list of indicators separated into categories of "child health", "maternal health", and "other".

However, after further research of the available literature, we realized some of the information was inexistent or unavailable to every country, and gathering first hand data was not a possibility. As such, we decided to settle on a set of 13 "core" indicators, which were the ones we thought would be providing crucial information needed to map inequalities in the MASCOT project.

These 13 indicators were selected from a combination of the 11 UN Millennium Development Goals (MDG) indicators, and the 39 indicators used by the Countdown to 2015 for Maternal, Newborn and Child Survival. They are separated into 3 long-term indicators and 8 short-term indicators. We also added 2 more short-term indicators (a.4, a.5), as we felt this was information we also found primordial. (Fig1)

Although all countries monitor and report on a large number of health indicators, updates on health status indicators are often based on predictions. Furthermore, there are major gaps in the availability of recent data to assess progress. Therefore, a small subset of 11 core indicators was recommended to ensure the collection of consistent and timely data needed to hold govern-

ments and development partners accountable for progress in improving women's and children's health, without adding to countries' reporting requirements. (9)

Work was further competed by using the PROGRESS framework as a useful starting point for summarizing and describing the broad field of health determinants. The acronym stands for: Place of residence, Race/ethnicity, Occupation, Gender, Religion, Education, Socio-economic status (SES) and Social capital; and was first used by Evans and Brown (2003). (10) These categories cover the basic determinants of health. These were used as independent variables to measure social inequality.

This acronym was also used by Kavanagh, J. et al, in three systematic reviews regarding child and young people health issues (11, 12, 13), as well as in the Cochrane Collaboration review of smoking cessation in pregnant women (14), in which we based the information to determine which PROGRESS categories were of absolute importance for the MASCOT project.

The above mentioned systematics reviews include 128 studies where the PROGRESS categories were included and the predictive value of the variables was associated to inequalities in the conditions studied.

Figure 1: New Version of the Data matrix using only our base categories

Selected Maternal, Newborn and Child health Indicators

a) Basic Indicators selected to monitor the status of women's and children's health

According to WHO, these three health status are essential for monitoring MDGs, but they are separated from the other below because they are relatively insensitive to change, and do not show progress over short periods (in the absence of birth and death registration systems they can only be measured with substantive time lags).

a.1 Maternal Mortality Ratio: Deaths per 100000 live births.

a.2 Under-five child Mortality: deaths of children under five per 1000 live births.

a.3 Children under 5 who are stunted: percentage of children under five years of age whose height-for-age is below minus ☐ two standard deviations from the median of the WHO Child Growth Standards.

a.4 Adolescent Pregnancy: number of pregnancies in women from 12 to 19 years of age per 1000 live births.

a.5 Nutrition: The average amount of calories consumed per day per person in a specific area in any given time period.

b) Other Short-term Indicators

According to WHO, these eight coverage indicators have been selected because they are strategic and significant: each one represents a part of the continuum of care and each one is connected with other dimensions of health and health systems. Also, it is more sensitive and timely data that can monitor almost real-time changes in a set of key interventions to improve women and children's health.

b.1 Met need for contraception: Proportion of women aged 15-49 years who have met their need for family planning, i.e. who do not want any more children or want to wait at least two years before having a baby, and are using contraception .

b.2 Antenatal Care Coverage: Percentage of women who used antenatal care provided by skilled health personnel for reasons related to pregnancy at least once during pregnancy, as a percentage of live births in a given time period.

b.3 Skilled Attendant at Birth: is a, physician, obstetrician nurse or other health care professional who provides basic and emergency health care services to women and their newborns during pregnancy, childbirth and the postpartum period.

b.4 Postnatal Care for Mothers and Babies: percentage of mothers and babies who received postnatal care visit within two days of childbirth.

b.5 Exclusive Breastfeeding for 6 months: percentage of infants aged 0–5 months who are exclusively breastfed.

b.6 DTP3 Vaccination: three doses of the combined diphtheria, pertussis and tetanus vaccine (percentage of infants aged 12–23 months who received three doses of diphtheria/pertussis/tetanus vaccine.

b.7 Antibiotic Treatment for Pneumonia: percentage of children aged 0–59 months with suspected pneumonia receiving antibiotics

Selected PROGRESS Categories

Again, when studying the PROGRESS indicators, we came to the conclusion that some of these categories might be unavailable to all countries, so through the analysis of the before mentioned four systematic reviews, we separated the categories most likely to be recorded, as well as accessible, the following PROGRESS indicators were selected:

a.1 Place of residence: The place of residence refers to the civil subdivision of a country (district, county, municipality, province, department, state) in which the individual resides.

a.2 Ethnicity: is a group of people whose members identify with each other, through a common heritage, often consisting of a common language, a common culture (often including a shared religion) and/or an ideology that stresses common ancestry or endogamy.

a.3 Gender: Is a range of characteristics used to distinguish between male and female.

a.4 Religion: Is a collection of cultural systems, belief systems, and worldviews that establishes symbols that relate humanity to spirituality and, sometimes, to moral values.

a.5 Occupation: any activity on which time is spent by a person.

a-6 Education Level of the household

a.7 Socio-Economic Status: an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, education, and occupation.

For this study the SES is defined by the   combination of occupation and education. When possible we will use the House Wealth Index (HWI). It is available in UNICEF surveys and demographic health surveys (DHS). In countries where other data sources are used, the sources of raw data can vary, which means that other strategy of data sources combination were needed. The construction of the HWI uses information on assets or household possessions, thought to be indicative of wealth, generate weights (factor scores) for each of the assets through principal components analysis, weights summed by household, household members ranked according to the total score of the household in which they reside, divide the households into quin-

tiles–each containing 20 percent of the household members (Disaggregation levels: lowest, second, middle, fourth, highest).

Determination of Inequalities

Inequalities were estimated by associating each MASCOT selected indicator by all categories of the PROGRESS socioeconomic indicators.

Chi^2 was used to assess the association among variables and odds ratios, with 95% confidence intervals, were computed as measure of inequality. Test of homogeneity among odds ratios were performed to evaluate the null hypothesis of no inequality. Linear trend was tested when PROGRESS indicator had more than 2 categories, and heterogeneity of odds ratios was statistically significant. The STATA 12 statistic software was used to generate the analysis. Its output results were the Log for each country in the sample. Subsequently, we conducted the analysis.

Results

Data collection and sources varied for each country and was not always complete. The sources and databases used for the individual analysis of each country were from a very diverse nature and from different years.

- Bolivia: incorporates mainly data from the 2008 UNICEF-Survey as well as the 2008 Demographic Health Service (DHS-2008).

- Brazil: used data from the 2010 UNICEF Survey the 2010 Brazilian Institute of Geography and Statistics (IBGE – 2010) the Millennium Development Objectives Site (http://www.portalodm.com.br/sistemas,), data from the website http://sistemas.aids.gov.br/monitoraids/of the year 2008 and from the 2006 National Survey by House

hold Sampling (PNAD -2006)

- Chile: used data from different official sources; the Department of Health Statistic and Information (DEIS, MINSAL) from the Chilean Ministry of Health, the 2010 Deaths database and Birth records from the National Statistics Institute (INE) and the 2009 Survey of Socioeconomic Characterization (CASEN).

- Costa Rica: the report used a combination of data sources; the National Census 2000, the 1999 and 2000 National HOUSEHOLD Surveys, the 1996 and 2006 National Nutrition Surveys, the National Census of school children's height aged 6 to 8 years, the National Reproductive Health Survey (2009) and the National registry of Health Care and Vital Statistics (1996 and 2010).

- Mexico: the Demographic and Health Survey Series (1998) was used.

The variation in data sources limited the availability for cross tabulation of the health indicators with all PROGRESS socioeconomic indicators.

It was complicated to compare health and PROGRESS indicators between countries because not all collected data were from the same year and neither were these collected using the same methodology. However, the health distribution tendency for the selected indicators, presents certain similarities. One of them refers to the PROGRESS indicator of *Place of Residence* (Urban or Rural), which was present for the analysis in all health indicators and was identified as a different predicting variable. We present the result grouped by health indicator comparing these between countries when possible and in relation to the PROGRESS indicators.

Maternal Mortality Ratio (Table 1)

Defined as: deaths per 100.000 live births

Only Chile informed about the Maternal Mortality rate. Estimation was made through use of three databases: Deaths and Births during 2010, official records from DEIS and INE and from population records. With these databases it was only possible to cross reference with PROGRESS indicators *Place of Residence* and *Education Level*. The index of Ethnicity and Socio-economic Status are present in other databases but they are not associated with maternal mortality. Religion as an indicator was not available for analysis.

Table 1 presents evidence of an important difference on maternal mortality by place of residence and a difference between educational level (Higher education level corresponds with a lower maternal mortality rate).

Table 1 Maternal Mortality Rate (Maternal Deaths per 100.000 live births).

		Bolivia	Brazil	Chile (2010)	Costa Rica	Mexico
Place of residence	Urban		-	16,9	-	-
	Rural	-	-	31,5	-	-
Education Level	Higher	-	-	4,3	-	-
	Medium	-	-	20,1	-	-
	Primary	-	-	40,9	-	-

Under-five child Mortality (Table 2):

Defined as: deaths of children under five years old per 1000 live births

This health indicator was only reported by Chile, Brazil (for 2010) and Costa Rica (2000). The report from these countries is partial in relation to PROGRESS indicators; it only informs about place of residence and gender.

Table 2 only indicates child mortality according to place of residence in Chile. In Brazil the under five child mortality rate is highest but does not show a difference between urban and rural strata. Costa Rica does not present this information.

The index by gender shows a significant difference in Chile, where male children under five years of age have a higher death risk compared to females. The numbers presented in Costa Rica are the lowest and have no strata difference. Brazil does not present information.

Children under 5 who are stunted (Table 3):

Defined as: percentage of children under five years of age whose height-for-age is below minus two standard deviations (-2SD) from the median of the WHO Child Growth Standards.

Only Chile (2010) and Brazil (2006) presented information, as shown in table 3. Both countries show differences according to place of residence; there is a higher prevalence of stunted children in rural areas is higher compared to urban areas. We did not find a difference between stunting for different ethnic groups for the analyzed countries. Gender index shows a difference in both Brazil and Chile; the number stunted children are higher for male gender. Even though the indicator of socioeconomic status (only reported by Chile) shows differences among indigent, poor and no poor strata, these differences are not statistically significant.

Table 2 Under-five Child Mortality (Children Deaths per 100.000 live births).

		Bolivia	Brazil (2010)	Chile (2010)	Costa Rica	Mexico
Place of residence	Urban	-	20.1	7.1	-	-
	Rural	-	20.1	5.5	-	-
Gender	Male	-	-	7.5	2.8*	-
	Female	-	-	6.2	2.1*	-

Table 3 Stunted Children under five (% of Children with Height for Age below -2SD).

		Bolivia	Brazil (2006)	Chile (2010)	Costa Rica	Mexico
Place of residence	Urban	-	6.9	3.8	-	-
	Rural	-	7.6	4.8	-	-
Ethnicity	Ethnic	-	No difference	No difference	-	-
	No Ethnic	-	No difference	No difference	-	-
Gender	Male	-	8.1	4.1	-	-
	Female	-	5.8	3.5	-	-
Religion	Catholic	-	No difference	-	-	-
	Evangelic	-	No difference	-	-	-
Social Economic Status	Indigent	-	-	5.6	-	-
	Poor	-	-	4.0	-	-
	No Poor	-	-	3.6	-	-

Adolescent Pregnancy (Table 4):

Defined as: number of pregnancies in women aged 12 to 19 years per 1000 live births

This health indicator is represented by all analyzed countries but different years and databases were used to gather data. The crossing of reference with PROGRESS indicators is partial, as show in Table 4.

Adolescent Pregnancy according to place of residence shows that Brazil, Chile, Costa Rica and Mexico have higher numbers in rural areas, while in Bolivia the proportion is inverted and presents a higher index of adolescent pregnancy in urban areas.

Brazil shows a higher number of adolescent pregnancies for ethnic groups compared to the non-ethnic group. Costa Rica only informs about prevalence in the ethnic group but has no data to compare with other groups.

Only Brazil reports about differences in religion related to this health indicator: the prevalence of adolescent pregnancy in the catholic group compared to the non-religious group is way higher. Most countries show a reverse relationship between education level and adolescent pregnancy; the lowest educational level is related to the highest prevalence of adolescent pregnancy. The only exception is Bolivia that shows a higher percentage of adolescent pregnancy for the group Secondary Education compared to lower primary or No-Education at all. Bolivia is the only country with information about socioeconomic status: adolescent pregnancy is highest for the group Higher Socioeconomic status and is lower Second strata. This difference is not statistically significant.

Table 4 Adolescent Pregnancy (% of women aged 12 – 19 years per 1000 live births)

		Bolivia (2008)	Brazil (2010)	Chile (2010)	Costa Rica (2000)	Mexico (1998)
Place of residence	**Urban**	10.4	1.6	15.1	4.4	3.3
	Rural	6.7	6.0	18.9	7.9	5.2
Ethnicity	**Ethnic**	-	48.6	-	14.9	-
	No Ethnic	-	43.0	-	-	-
Religion	**Catholic**	-	62.7	-	-	-
	Other/No Religion	-	7.8	-	-	-
Education Level	**Higher**	-	97.9	2.0	1.7	2.2
	Secondary	20.0		20.0	-	6.0
	Primary	14.1	(Literacy group)	22.5	10.5	19.5
	None	18.2		13.0	-	44.4
Social Economic Status	**Poorest**	16.2	-	-	-	-
	Second	10.8	-	-	-	-
	Third	20.8	-	-	-	-
	Fourth	20.7	-	-	-	-
	Richest	22.2	-	-	-	-

Met need for contraception (Table 5):

Defined as; proportion of women aged 15 to 49 years who have met their need for family planning, i.e. who do not want any more children or want to wait at least two years before having a baby, and are using a contraception method.

Four countries inform about this indicator. Chile does have information but this does not include the PROGRESS indicator and therefore it cannot be compared.

Bolivia and Mexico show differences according to place of residence; contraception need is more frequent in urban areas, while Brazil and Costa Rica do not show significant differences.

Ethnic indicator, only reported by Brazil, does not show significant differences. According to religion, Brazil shows an important difference: Catholic group have the highest prevalence of Met need for contraception. Costa Rica however shows a higher probability of not using contraceptive methods than Catholic and Others / Non-religious groups.

According to Educational Level both Bolivia and Costa Rica show differences. Mexico reports double percentages of Met for contraceptives in the group Primary level Education compared to the group with No education, while Brazil does not report differences between Education levels. The cross reference with the socioeconomic status, only performed by Brazil, shows a distribution that is directly proportional among its strata. The poorest with the lower numbers of Met need for contraception and at the higher levels the bigger prevalence. Differences are statistically significant.

Table 5 Met Need for Contraception (% of women aged 15 -49 with family planning, do not want children / want to wait at least two years and use contraception method).

		Bolivia (2008)	Brazil (2010)	Chile (-)	Costa Rica (1999)**	Mexico (1998)
Place of residence	**Urban**	67.4	80.9	-	No difference	38.9
	Rural	48.5	78.8	-	No difference	29.1
Ethnicity	**Ethnic**	-	34.3	-	-	-
	No Ethnic	-	36.8	-	-	-
Religion	**Catholic**	-	62.9	-	79.0	-
	Other/No Religion	-	24.0	-	86.0	-
Education Level	**Higher**	-	No difference	-	71.0	32.7
	Secondary	70.7	No difference	-	78.0	30.2
	Primary	57.2	No difference	-	87.0	41.7
	None	35.4	No difference	-	86.0	24.7
Social Economic Status	**Poorest**	41.2	-	-	-	-
	Second	58.8	-	-	-	-
	Third	66.0	-	-	-	-
	Fourth	68.8	-	-	-	-
	Richest	67.9	-	-	-	-

Antenatal Care Coverage (Table 6):

Defined as; the percentage of women who used antenatal care provided by skilled health personnel at least once during pregnancy, as a percentage of live births in a given time period.

Bolivia, Brazil, Costa Rica and Mexico provided (incomplete) information about this indicator. According to place of residence, Bolivia and Brazil show a difference between the rural areas, with less coverage compared to urban areas with higher coverage. Costa Rica does not show geographical differences in Antenatal Care Coverage.

There is no information available for Ethnic and Religious indicators. Bolivia, Brazil and Mexico show higher percentages of Antenatal Care coverage for the group with Higher Education. Information about Socio-economic Status (SES) is only provided by Bolivia and shows a direct proportional relationship; the higher the SES the higher the Antenatal Care Coverage. And because of this direct proportional relationship we see lower Antenatal Care Coverage for lower Socio-economic Status.

Table 6 Antenatal Care Coverage (% of women used antenatal care provided by skilled health professional during pregnancy as a percentage of live births).

		Bolivia (2008)	Brazil (2010)	Chile (-)	Costa Rica (1999)	Mexico (1998)
Place of residence	Urban	91.2	95.1	-	No difference	72.0
	Rural	60.4	89.6	-	No difference	47.8
Ethnicity	Ethnic	-	Data not done	-	-	-
	No Ethnic	-	Data not done	-	-	-
Religion	Catholic	-	61	-	-	-
	Other/No Religion	-	Data not done	-	-	-
Education Level	Higher	-	86.6	-	98.7	-
	Secondary	94.8	-	-	93.6	-
	Primary	70.2	-	-	67.9	-
	None	45.8	10.7	-	34.8	-
Social Economic Status	Poorest	49.1	-	-	-	-
	Second	78.7	-	-	-	-
	Third	89.6	-	-	-	-
	Fourth	89.2	-	-	-	-
	Richest	100	-	-	-	-

Skilled Attendant at Birth (Table 7):

Defined as; availability of a physician, obstetric nurse or other health care professional who provides basic and emergency health care services to women and newborns during pregnancy, childbirth and the postpartum period.

Bolivia, Chile and Costa Rica provided information. Chile does not show differences for Skilled Birth Attendance for Place of Residence (urban or rural), while Bolivia does reports a significant difference. Although Costa Rica reports a statistic significant difference between rural and urban areas, the Skilled Attendance at birth is 0.4 times higher in urban areas.

Only Costa Rica reports cross reference for Religion which shows a 1.6 times higher of Skilled Attendant at Birth for Catholic compared to Other Religious groups.

Both Bolivia and Costa Rica informed about Education Level: a direct proportional relation shows higher numbers of Skilled Attendant at Birth for the group Higher Education levels. The Socioeconomic status was only informed by Bolivia and it highlights an important difference among strata; the higher the Socioeconomic Status, the lower the Skilled Attendant at Birth.

Table 7 Percentage of Skilled Attended at Birth

		Bolivia (2008)	Brazil (-)	Chile (2010)	Costa Rica (1999)	Mexico (-)
Place of residence	**Urban**	55.4	-	99.97	94.0	-
	Rural	32.4	-	99.9	97.0	-
Ethnicity	**Ethnic**	-	-	-	-	-
	No Ethnic	-	-	-	-	-
Religion	**Catholic**	-	-	-	73.5	-
	Other/No Reli-	-	-	-	22.3	-
Education Level	**Higher**	-	-	No difference	12.2	-
	Secondary	90.0	-	No difference	35.0	-
	Primary	47.8	-	No difference	47.5	-
	None	18.1	-	No difference	1.0	-
Social Economic Status	**Poorest**	18.9	-	-	-	-
	Second	57.8	-	-	-	-
	Third	79.2	-	-	-	-
	Fourth	85.4	-	-	-	-
	Richest	95.6	-	-	-	-

Postnatal Care for Mothers and Neonates (Table 8):

Defined as; the percentage of mothers and Neonates who received postnatal care visit within two days after childbirth.

Only Bolivia provided information. In urban areas the postnatal care rate is higher compared to rural areas. Primary Education and Lower Social Economic status (Poorest and Second Strata) show higher levels of Postnatal Care. Neonates

Table 8 Percentages of post Natal Care for Mothers and Neonates (Day 2 after birth)

		Bolivia (2008)	Brazil (-)	Chile (-)	Costa Rica	Mexico (-)
Place of residence	Urban	55.6	-	-	-	-
	Rural	44.4	-	-	-	-
Ethnicity	Ethnic	-	-	-	-	-
	No Ethnic	-	-	-	-	-
Religion	Catholic	-	-	-	-	-
	Other/No Reli-	-	-	-	-	-
Education Level	Higher	-	-	-	-	-
	Secondary	37.5	-	-	-	-
	Primary	51.8	-	-	-	-
	None	-	-	-	-	-
Social Economic Status	Poorest	25.3	-	-	-	-
	Second	25.7	-	-	-	-
	Third	17.6	-	-	-	-
	Fourth	-	-	-	-	-
	Richest	-	-	-	-	-

Exclusive Breastfeeding for 6 months (Table 9):

Defined as; the percentage of infants aged 0 to 6 months who are exclusively breastfed

Bolivia and Mexico provided information on this regard. It shows higher percentage of exclusive breastfeeding in rural areas. Bolivia did not report newborn gender differences. Education Level shows an inverse proportional difference, where the lower Education level shows higher percentage of Exclusive Breastfeeding.

The cross reference with the socioeconomic status follows the same tendency: poorest strata show higher percentage of Exclusive Breastfeeding compared to the richest strata.

Table 9 Percentage of Exclusive Breastfeeding for Six Months

		Bolivia (2008)	Brazil (-)	Chile (-)	Costa Rica (-)	Mexico (1998)
Place of residence	Urban	29.1	-	-	-	30.5
	Rural	58.3	-	-	-	61.7
Ethnicity	Ethnic	-	-	-	-	-
	No Ethnic	-	-	-	-	-
Gender	Male	40.2	-	-	-	-
	Female	41.3	-	-	-	-
Education Level	Higher	-	-	-	-	75.6
	Secondary	31.9	-	-	-	83.2
	Primary	44.3	-	-	-	93.5
	None	63.2	-	-	-	97.7
Social Economic Status	Poorest	55.7	-	-	-	-
	Second	40.7	-	-	-	-
	Third	39.1	-	-	-	-
	Fourth	36.2	-	-	-	-
	Richest	25.0	-	-	-	-

DTP3 Vaccination (Table 10):

Defined as; the percentage of infants aged 12 to 23 months who received three doses of diphtheria/tetanus/pertussis (DTP) vaccines

Only Bolivia reported about this indicator. There were no differences between vaccination rates when analyzed for place of residence and gender. According to Level of Education only Non and Primary Education were analyzed; the Primary Education Level shows a higher percentage of DTP3 Vaccination compared to No Education Level. Due to scattered data the socioeconomic status could not be analyzed.

Antibiotic Treatment for Pneumonia

Defined as: the percentage of children aged 0 to 59 months with suspected pneumonia who received antibiotics.

There was no information available for this indicator.

Table 10 Percentage third DTP Vaccination

		Bolivia (2008)	Brazil (-)	Chile (-)	Costa Rica (-)	Mexico (-)
Place of residence	Urban	No difference	-	-	-	-
	Rural	No difference	-	-	-	-
Ethnicity	Ethnic	-	-	-	-	-
	No Ethnic	-	-	-	-	-
Gender	Male	No difference	-	-	-	-
	Female	No difference	-	-	-	-
Education Level	Higher	-	-	-	-	-
	Secondary	-	-	-	-	-
	Primary	59.3	-	-	-	-
	None	11.2	-	-	-	-
Social Economic Status	Poorest	Disperse data	-	-	-	-
	Second	Disperse data	-	-	-	-
	Third	Disperse data	-	-	-	-
	Fourth	Disperse data	-	-	-	-
	Richest	Disperse data	-	-	-	-

Discussion and Conclusions

The countries participating in the regional sample for Latin America (Bolivia, Brazil, Chile, Costa Rica and Mexico) show heterogeneous geographical, demographic, social, economic and cultural structures.

However in Latin America, the distribution of the selected health indicators presents similarities, particularly for the PROGRESS socioeconomic indicators; *Place of Residence, Education and Gender*. Other PROGRESS indicators such as *Religion, Ethnicity and Socioeconomic Status* were only partially reported. Therefore, the analysis shows only partial results related to each country.

The lack of data for all countries limited the availability for cross-tabulation of the health indicators with all PROGRESS indicators. Sometimes it was complicated to compare Health and PROGRESS indicators between countries because not all collected data were from the same year.

Moreover the data was compiled from different sources and is illustrative of the differences between countries and regional trends in MCH related indicators. However, it should be noted that results are not directly comparable.

Measuring indicators of maternal and child health is one of the fundamental aspects of preventing ill health. Concerted efforts at the local, national and international level are essential to systematically collect robust data for monitoring and evaluation policies and programmers and ensuring accountability to the population they serve. A priority for the LA region is to improve the collection of disaggregated data through population-based surveys, as well as qualitative data that can help understand the dynamics of the SDH and to strengthen the equity approach, and focus on the most disadvantaged to better track improvements in MCH and MCHI across the social gradient.

MASCOT is looking into exploring for further financing as to be able to compare the selected indicators with data that is soon to be released or has recently been released in the selected countries. Then we will be able to compare the way each country has had or not, an impact in reducing health inequities and if they had better health indicators.

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MT, C-JM, FB, AS selection of indicators

C-JM, MT data collection and analysis

C-JM, FB, MT, AS, drafting and reviewing

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