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REVIEW

Equity in maternal health care service utilization: a systematic review for developing countries

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Abstract
Objectives The objective was to explore progress of equity in the utilization of maternal health care services in developing countries since maternal care is a crucial factor in reducing maternal mortality, which is targeted by the Millennium Development Goal 5.
Methods A systematic review of quantitative studies was done. PubMed Central, Web of Science, and Science Direct databases were searched for peer-reviewed and English-language articles published between 2005 and 2015.
Results Thirty-six articles were included in the review. The results reveal the lack of equity in the utilization of maternal health care in developing countries. Thirty-three out of 36 studies found evidence supporting severe inequities while three studies found evidence of equity or at least improvement in terms of equity.
Conclusions Most of the literature devoted to utilization of maternal health care generally provides information on the level of maternal care used and ignore the equity problem. Research in this area should focus not only on the level of maternal care used but also on the most disadvantaged segments of the population in terms of utilization of maternal care in order to reach the set targets.

Keywords Equity · Maternal care · Developing countries · Health care utilization · Systematic review

Introduction

Maternal mortality and its reduction have long been a challenge in developing countries, despite the existence of effective interventions. Maternal mortality leads to decreased productivity and poorer child health, resulting in decreased human capital. Hence, maternal mortality indirectly perpetuates a cycle of poverty, which in itself decreases health and utilization of health care, causing further maternal mortality (Sullivan and Hirst 2011). In this context, reducing maternal deaths has become a global priority and, therefore, the United Nations (UN) Millennium Declaration was ratified by 189 member states in 2000. The declaration was formulated into eight Millennium Development Goals (MDGs) (UN 2014a, b). The MDG-5 was "to improve women's health". One of the main targets is to reduce the maternal mortality rate (MMR) by 75 % by 2015.

It can be argued that providing equity in maternal health care service utilization is vital to improve maternal health and to decrease MMR. Equity in utilization of health care services is related to the opportunity of utilizing equal treatments for equal needs; irrespective of socio-economic status (Wagstaff and Van Doorslaer 2000). In this regard,

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the concepts of equity and equality are unfortunately widely mistaken in the existing literature. Equality is merely two things being equivalent. Therefore, health inequality can be seen as the uneven distribution of health within a population due to natural age or gender processes. For example, it is expected that younger individuals use less health care than older individuals do, which cannot be seen as unfair (Braveman and Gruskin 2003). When the issue at hand is health care utilization, examining equality will only provide information relating to the differences among individuals due to characteristics such as demographics, gender, and socio-economic status. The important question to be addressed is rather "Whether on average, persons in equal need of treatment receive similar treatment, regardless of their income?" (Wagstaff and Van Doorslaer 2000).

Previous systematic reviews in this are lacking a focus on equity and generally focus on factors affecting maternal health care utilization (see, for example, Simkhada et al. 2008). On the other hand, Say and Raine (2007) reviewed key maternal health care interventions by urban–rural and economic differentials; however, they did not make a clear distinction between equity and equality. Therefore, this review is the first attempt to examine previous literature on maternal health care utilization in developing countries in the context of equity, which is urgently needed to evaluate progress towards fulfilling the MDG-5. Together with aggregating and summarizing the results and policy implications from previous research, this study offers its own set of policy implications.

This study is designed as follows. Section 2 explains the methodology used for this systematic review in detail. Section 3 demonstrates the collective results from the reviewed papers. Section 4 presents a discussion including policy implications and limitations to the study. The protocol for this study can be found as an Electronic Supplemental Material.

Method

Identification of studies

A systematic literature search was conducted in three electronic databases, PubMed Central, Web of Science and Science Direct, for peer-reviewed, English-language articles published between 2005 and 2015. These databases allow for identification both in medical and social science journals. A broad range of search terms that have been used to identify equity in maternal health care service utilization are "equity in health care utilization", "equity in health care access", "horizontal equity", and simply "equity". For an article to be selected, one of these search terms needed to be combined with the following keywords: "maternal care services" or "antenatal care services" or "prenatal care services" and also with "developing countries". A country's development status was determined using the OECD's list of developing countries and territories (OECD 2012). In addition, the reference lists of selected articles were screened manually by the authors in order to identify additional articles.

The search is restricted to the last decade, as there have been fast improvements in research and attention to equity in maternal health care service utilization in developing countries, which can largely be attributed to the MDGs. Furthermore, only studies using empirical analysis, or at least a calculation of a concentration index, are included in order to be able to statistically identify the current level of equity or, if several years were used, to be able to track the changes in equity or to be able to identify the effects from a specific intervention.

Data extraction process

After the electronic search in all databases, authors screened articles by their titles and then by their abstracts for relevance. The full texts of relevant articles, which were accessible, were downloaded for further assessment. Uncertainties in the whole screening process were resolved through detailed discussion between the authors. Figure 1 represents the data extraction process. A total of 991 articles from all three databases were screened. After title screening, 188 articles were found to be irrelevant, and 803 articles were further assessed by their abstracts. Although a total of 136 articles were found to be relevant, four of these articles were not accessible and, hence, eliminated, whereas three articles were added manually through a reference list check. A total of 99 articles were eliminated after full text screening. The final number of articles used for the systematic review is 36.

The main quality and relevance issues in the screening and elimination process can be stated as follows: for a developing country or not; formulating a research question regarding equity, or at least has implications for equity, or did not; conducted an empirical analysis, or at least calculated a concentration index, or did not; clearly defining an outcome variable or did not (since maternal care covers the period of pregnancy, child birth and the post-partum period, the main outcome variables relevant for the search were determined as antenatal care (ANC), maternal care, delivery, and postnatal care (PNC). Therefore, studies focusing on any other outcome variables were not selected. Furthermore, the articles used a child rather than a woman as the unit of the analysis were eliminated since the focus of this review requires a woman as the main outcome variable); presenting the characteristics of data and data

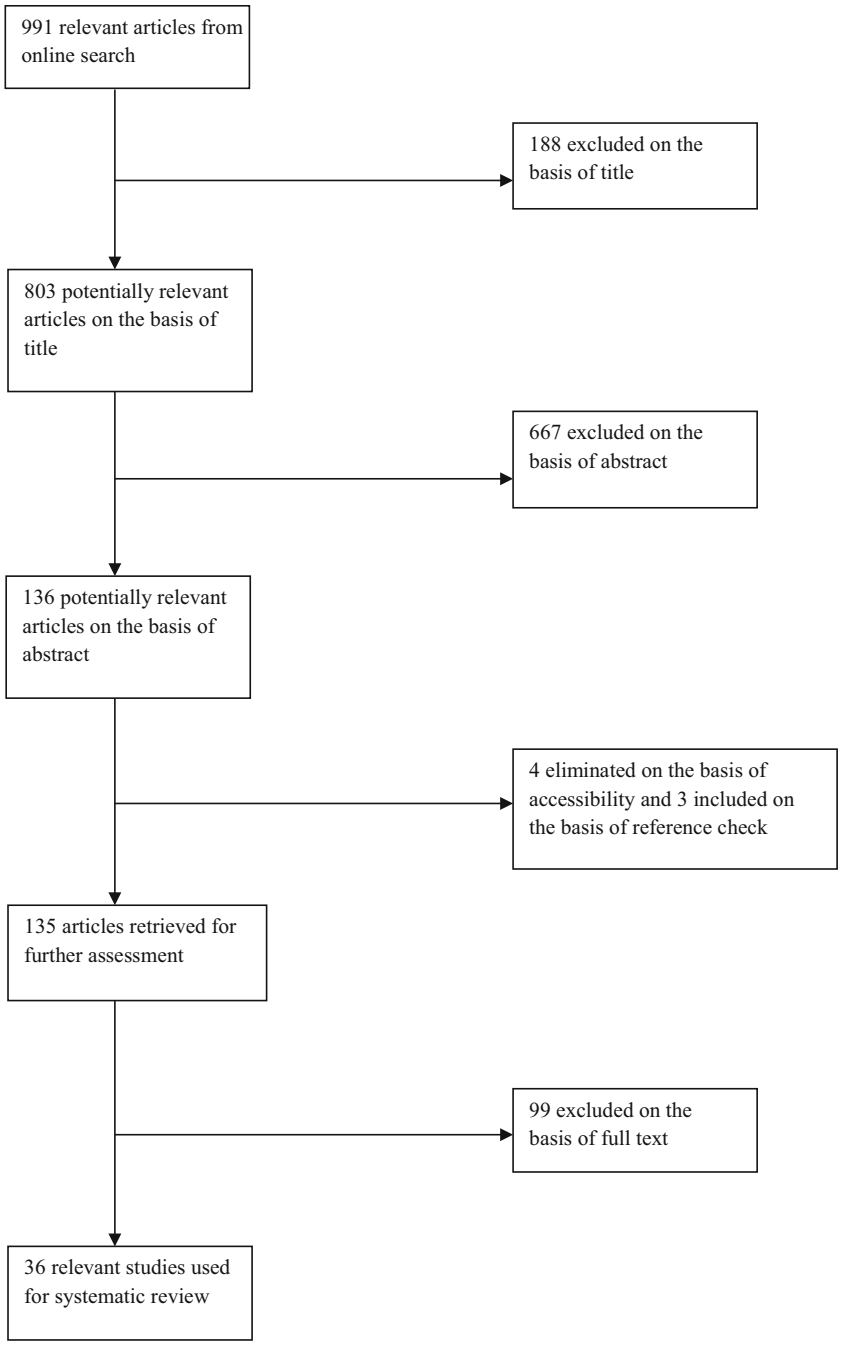

Fig. 1 Data extraction process of the systematic review

collection procedure or did not (the articles using their own conducted survey or nationally representative surveys conducted by governments or institutions are both included); and focusing on utilization not on spatial access (spatial access, which plays an important role in utilization, is mostly relating to the supply-side factors and indicates the spatial separation between health care facilities and people needing health care (Yao et al. 2013).

Qualities of the reviewed studies are assessed and reported in Table 1, as excellent, good, and fair using the following criteria. The selection criteria mainly follow Say and Raine (2007) and changes have been made by the authors to fit the needs of this review:

- Clear and focused research question (higher if regarding equity-lower if only has implications for equity).
- Clear presentation of data and the data collection procedure.
- Clearly defined outcome variable(s).
- Characteristics of the data collection tools (higher if nationally representative survey).
- Clear definition of the methodology.

Table 1 Summary analysis and quality assessment of the studies of equity in utilization of maternal care services in developing countries

References	Location/ study setting	Study design	Methodology	Outcome measure (utilization of)	The existence of equity	Factors affecting use of maternal care	Contextual issues	Quality assessment
Ahmed et al. (2010)	31 developing countries	Demographic and health surveys	Logistic regression model	Contraceptive use/antenatal care (4+ visits)/skilled birth attendance	No	Economic status, education and empowerment score of women		Excellent
Kruk et al. (2008)	45 developing countries	Demographic and health surveys	Multivariable regression analysis	Skilled birth attendance	No	Income		Excellent
Ahmed and Khan (2011)	Bangladesh	Survey	Concentration index and logistic regression model	Antenatal care/skilled birth attendance/postnatal care	No	Income, the age and education of the women, husband's education, involvement in income-earning activities by women	Contrary to the inverse equity hypothesis, the voucher scheme reduced inequality even in the short run. However, socioeconomic disparity in the use of maternal health services has remained pro-rich	Good
Hajizadeh et al. (2014)	Bangladesh	Demographic and health survey	Inequity indices and weighted linear regression	Antenatal care/delivery care/skilled birth attendance	No	Wealth, education and place of residence	Poorer mothers seem to use proportionally more maternal care; however absolute differences have widened between the socioeconomic groups	Good
Dingle et al. (2013)	Cambodia	Demographic and health survey	Equity gaps, equity ratios, concentration curves and concentration indices	Antenatal care (4+ visits)/ skilled birth attendance/ delivery care/contraceptive use/ abortion by trained provider	No	Substantial inequities exist favouring wealthier, more educated women. However, reverse finding for urban/rural	Inequity in service use of all services dramatically reduced over time, except for postnatal care where inequity increased slightly	Good
Chomat et al. (2011)	Cambodia	Demographic and health survey	Univariate logistic regression and binary logistic regression	Delivery care/skilled birth attendance	No	Income, education, place of residence		Excellent
Khadr (2009)	Egypt	Survey	Concentration index and descriptive analysis	Antenatal care/skilled birth attendance/postnatal care	No	Wealth and education	There is an improvement over time in terms of proportions receiving maternal care. However, differentials/ inequities are still quite high	Good
Birmeta et al. (2013)	Ethiopia	Survey	Bivariate and multivariate Logistic regression	Antenatal care/delivery care	No	Education, income, exposure to media, and presences of husband approval		Good
Wado et al. (2013)	Ethiopia (south-western)	Survey	Multivariate logistic regression	Antenatal care	No	Age, residence, education, income, intended pregnancies, participating in decisions, first parity, living near health facility	Pregnancy intention is an important factor on ANC besides other factors	Good

Table 1 continued

References	Location/ study setting	Study design	Methodology	Outcome measure (utilization of)	The existence of equity	Factors affecting use of maternal care	Contextual issues	Quality assessment
Mohanty and Pathak (2009)	India	The national family and health survey	Bivariate analyses and concentration index	Delivery care/antenatal care/contraceptive use	No	Income	In addition to inequity, the general low level of maternal care services are mostly due to supply-side constraints	Fair
Baqui et al. (2008)	India	Survey	Concentration index	Antenatal care/delivery care/newborn care	No	Income		Good
Saxena et al. (2013)	India	Survey	Bivariate and multivariate logistic regression	Delivery care/antenatal care/contraceptive use	No	Income, education, place of residence	Poverty is the most important barrier for using maternal care since the impact of poverty on utilization does not change according to place of residence	Good
Pathak et al. (2010)	India	National family health survey	Concentration index and descriptive analysis	Antenatal care/skilled birth attendance	No	Income, place of residence		Excellent
Prakash and Kumar (2013)	India	The national family and health survey	Logistic regression Model, concentration curve and concentration index	Antenatal care/delivery care/immunization	No	Income, religion, ethnicity, education, place of residence		Good
Randive et al. (2014)	India	District level household survey, annual health survey and census of india	Concentration curve and concentration index	Skilled birth attendance/ delivery care	No	Male literacy, emergency obstetric care availability in public facilities and poverty		Fair
Singh et al. (2012)	India	The district level household survey	Concentration index and binary logistic regression	Antenatal care (4+ visits)	No	Wealth	The rich-poor gap in postnatal care (PNC) use was significantly wider for mothers with birth complications	Good
Rossier et al. (2014)	Kenya, Burkina Faso	Health and demographic surveillance	Multivariate logistic regression	Antenatal care (4+ visits)	Kenya (No) Burkina Faso (Yes)	Education, ethnicity, income are statistically significantly affect utilization in Kenya whereas they are not associated with utilization in Burkina Faso	The monitoring and the enforcement of regulations are stronger in Burkina Faso compared to Kenya because of the greater effect of public health sector in Burkina Faso	Fair
Zere et al. (2010)	Namibia	Demographic and health survey	Concentration index	Antenatal care/skilled birth attendance/postnatal care	No	Income, education, place of residence, regions with high human development indices		Good
Zere et al. (2011)	Namibia	Demographic and health survey	Linear probability model and concentration index	Skilled birth attendance	No	Income, education, place of residence		Good

Table 1 continued

References	Location/ study setting	Study design	Methodology	Outcome measure (utilization of)	The existence of equity	Factors affecting use of maternal care	Contextual issues	Quality assessment
Ononokpono et al. (2014)	Nigeria	Demographic and health survey	Multilevel logistic regression analysis	Postnatal care	No	Education, religion, ethnicity, occupation, household wealth index and household size	Maternal health interventions should take into consideration both disadvantaged individuals and communities	Excellent
Babalola and Fatusi (2009)	Nigeria	Survey	Multilevel analysis	Antenatal care/skilled birth attendance/postnatal care	No	Income, education, place of residence		Good
Agha (2011)	Pakistan (rural Jhang)	Survey	Bivariate and multivariate logistic regression	Antenatal care/delivery care/postnatal care	Yes	Income, age, parity and education	Differentials between poor and non-poor have significantly reduced after the implementation of demand side financing intervention	Good
Rahman et al. (2011)	Republic of Vanuatu	Vanatu multiple indicator cluster survey	Concentration curve and logistic regression	Antenatal care/skilled birth attendance/delivery care/counselling for HIV/AIDS	No	Income, maternal education, religion, counselling about HIV/AIDs (yes)		Excellent
Quayyum et al. (2013)	Rural Bangladesh	Survey	Dif-in-dif, propensity score matching and concentration index	Antenatal care/postnatal care	No	The intervention increases the utilization of ANC	Although the intervention has improved the utilization of PNC pro-poor; ANC services provided by medically trained provider did not improve and stayed pro-rich	Good
Chowdhury et al. (2006)	Rural Bangladesh	Survey	Logistic regression	Delivery care	No	Use of midwifes differ significantly with wealth (measured by asset quintiles)	The gap between rich and poor widened after the introduction of facility- based delivery intervention	Excellent
Amin et al. (2010)	Rural Bangladesh	Survey	Multivariate logistic regression	Antenatal care/postnatal care/delivery care/ newborn care	No	Wealth, women's education, husband's education		Good
Liu et al. (2014)	Rural China	Survey	Concentration index and concentration curve	Antenatal care/delivery care/postnatal care	No	Age, ethnicity, wealth, women's education and husband's education	The policies should not only focus on narrowing the gap of income but also on improving education of ethnic minority woman in rural remote areas	Good
Shen et al. (2014)	Rural China	Survey	Concentration index and concentration curve	Antenatal care/delivery care/postnatal care	No	Income	The pro-rich inequity reflects the fact that the costs associated with delivery at a healthcare facility means an important financial burden for low-income families	Good
Xiang et al. (2014)	Rural China	Survey	Multiple logistic regression	Postnatal care (3 + visits)	Yes	No difference in postnatal care utilization in factors such as education, income, employment	PNC use in rural China was not significantly different between regions with different levels of development	Fair

Table 1 continued

References	Location/ study setting	Study design	Methodology	Outcome measure (utilization of)	The existence of equity	Factors affecting use of maternal care	Contextual issues	Quality assessment
Kamiya (2011)	Tajikistan	Tajikistan living standards survey	Bivariate and univariate probit models	Antenatal care/skilled birth attendance/delivery care	No	Female autonomy, education, the number of children, income	In addition to the classical determinants, female autonomy is found to be an important determinant for receiving ANC and delivery care	Fair
Limwattananon et al. (2010)	Thailand	The multiple indicator cluster survey	Concentration index	Skilled birth attendance/ delivery care	Yes	Maternal education	Universal health coverage in Thailand has resulted in a fairly equitable distribution of MCH services	Good
Liabsuetrakul and Oumudee (2011)	Thailand (southern)	Survey	Logistic regression	Delivery care	No	Religion, education, health insurance, out-of-pocket payment, transportation difficulties	Health insurance and socioeconomic determinants are crucial factors for utilization of delivery care	Good
Bbaale (2011)	Uganda	Uganda demographic and health survey	Probit model	Antenatal care	No	Education of the mother and her partner, wealth status, regional disparities, religious differences, access to media, maternal autonomy, occupations of the mother and her partner, timing of pregnancy, birth histories, and birth order		Good
Sepehri et al. (2008)	Vietnam	Vietnam national health survey	Two-part model	Antenatal care/delivery care	No	Income, education, ethnicity, geographical isolation, health insurance and high poverty rate in community	Not only the individual factors but also the commune should be taken into account in intervention programs	Excellent
Axelson et al. (2012)	Vietnam	Demographic and health surveys and multiple indicator Cluster survey	Concentration index	Antenatal care/delivery care/family planning/ immunization	No	Income, place of residence, education, ethnicity	The most inequitably distributed interventions were those requiring multiple service contacts, such as four or more antenatal care visits, and those requiring significant support from the health system, such as skilled birth attendance	Excellent
Målqvist et al. (2013)	Vietnam	The multiple indicator cluster survey	Multivariate logistic regression	Antenatal care/delivery care	No	Household economic status, maternal ethnicity, place of residence, maternal education		Excellent

- Conducting an empirical analysis (lower if only concentration index is used).
- Limitations to the study are pointed out clearly.

Results

A summary of reviewed studies is provided in Table 1. Unfortunately, there are only a few studies focusing on equity in maternal health care service utilization for developing countries. This issue can mostly be attributed to the unavailability of data. However, the findings of this systematic review still reveal important information regarding the achievement of equity, the factors affecting utilization of maternal care and relevant policy implications.

In this regard, among 36 studies, 12 studies are for Bangladesh and India and ten studies are for African countries (Nigeria, Egypt, Ethiopia, Kenya, Burkina Faso, Namibia, Republic of Vanuatu and Uganda) whereas three studies are for a group of developing countries. Other countries include Pakistan, Thailand, Vietnam, Cambodia, China, and Tajikistan. The findings of this review are important in the sense that pregnant women from developing countries are at greater risk of morbidity and mortality due to malnutrition and infections. Therefore, the findings may help policy-makers in policy design to achieve MDG for maternal health particularly in developing countries. Twenty-one studies used nationally representative surveys and researches used their own collected data in 15 studies. Eight studies focused on and analysed the effects of an intervention on equity in maternal care utilization and seven of them found significant improvements after implementation of the intervention. However, all of these seven studies argued that even though interventions improved equity, there was still much to cope with and, even after the interventions, the countries were still far from reaching their equity goals.

The reviewed studies use a wide range of outcome variables. The choice of outcome variables can be seen from Table 1 for each study. Most commonly used outcome variables are ANC, delivery care, PNC, and SBA. Twenty-six of the reviewed studies used antenatal care, 21 of them used delivery care, ten used postnatal care, and 14 used skilled birth attendance as outcome variables. Besides these mostly used outcome variables, some studies used additional outcome variables related to child health (such as immunization). Most studies choose to use several outcome variables together.

A majority of the studies (15 out of 36) had estimated some form of logistic regression using the chosen outcome variables to be the dependent variables (taking the value of 0 zero in case of no utilization and 1 in case of utilization of maternal health care services). Eleven studies had reported results from a concentration index along with descriptive statistics. On the other hand, seven studies used a concentration index with some form of empirical methods (mostly logistic regression) whereas the probit model and two-part models were the other methods used in three studies.

The results of the studies regarding equity reveal the lack of equity in utilization of maternal health care in developing countries. Thirty-three out of 36 studies found evidence supporting severe inequities while three studies found evidence of equity or at least improvement in terms of equity. The variety of choices among outcome variables did not affect the common main findings of the studies; which is the evidence of inequity. Xiang et al. (2014) found no evidence of inequity at all in rural China as opposed to Liu et al. (2014) and Shen et al. (2014) who found evidence of inequity in rural China. On the other hand, Agha (2011) and Limwattananon et al. (2010) found evidence for improvement in equity in Pakistan and Thailand, respectively. However, they mentioned that even with the current improvement as a result of the implemented interventions, the achieved level of equity cannot be considered enough. Finally, Rossier et al. (2014) found evidence of equity regarding Burkina Faso, but a contrary result for Kenya. All other studies indicated inequity for developing countries in utilization of maternal health care services. At this point, it should be emphasized that most of these findings related to equity were not obtained by standardizing the need of the study population, which is required to accurately measure (horizontal) equity, where equity is defined as equal health care utilization for equal need irrespective of other characteristics such as income, race, and education (O'Donnell et al. 2008). However, the type of health care focused on in these studies was maternal care that is needed by pregnant women or women in postpartum period, implying the standardized need in nature.

Regarding the factors affecting maternal care utilization, the results of the review indicate that the major determinants behind equity are income/wealth, women's education, race/ethnicity/religion, place of residence, maternal knowledge/maternal education/awareness and others (including parity, female autonomy, insurance, household size, and age).Among all these factors, income/wealth is found to be the most crucial factor determining who receives care. Thirty-four out of 36 studies found income to have statistically significant effects on the use of maternal care services. On the other hand, 24 studies stated that the level of education among women is another important determinant of utilization whereas urban/rural residence was also pronounced in 13 of the studies. Similarly, ten studies found that race/ethnicity/religion had statistically significant effects on maternal care utilization.

Discussion

It is well known that one of the most important MDGs is reducing maternal mortality, in which remarkable progress has been made (the maternal mortality ratio decreased 45 % between 1990 and 2013), but much more effort is needed to reach the target (i.e., reducing it by three-quarters) (UN 2014a, b). Most of the literature devoted to utilization of maternal health care generally provides information on the level of maternal care used and ignores the equity problem. However, an important part of MDGs (including, for example, the number one goal of eliminating extreme poverty and decreasing the proportion of undernourished people) has strong suggestions for improving equity in all aspects of human life. Similarly, in another policy document, Sustainable Development Goals (SDGs), which build upon the MDGs, can be seen to support that reducing inequalities, ending poverty, and ensuring health for all populations (SDG-3, SDG-5 and SDG-10) are among the most important aims to reach sustainable development (UN 2014a, b). From this point of view, not only the level of maternal care used but also the most disadvantaged segments of the population in terms of utilization of maternal care, should be taken into consideration in order to reach the set targets.

Equity in public health requires need as the primary determinant of health care utilization and emphasizes social position as the main determinant of inequity, which can be captured by wealth, education, race or gender (Malqvist et al. 2012). In this context, the most pronounced finding of this review relates to the lack of equity in maternal health care service utilization in developing countries. Most of the articles aim to analyse equity in maternal care utilization explicitly by using a concentration index or by evaluating the findings on the basis of equity (see, for example, Ahmed and Khan 2011; Quayyum et al. 2013; Khadr 2009) whereas equity is not explicitly mentioned in some of the studies but the results have implications relating to inequity (see, for example, Wado et al. 2013; Kamiya 2011; Birmeta et al. 2013). It is possible and crucial to mention that the heterogeneity of the choice of outcome variables used in the reviewed studies do not affect the main result of these studies. Most studies find evidence for inequity irrespective of the outcome variable used. On the other hand, the most common factor leading to inequity is found to be differences in the income levels; women in wealthier quintiles are found to be more likely to use maternal health care. This finding implies that reaching the MDG-5, which is reaching 75 % reduction in maternal mortality, requires also reaching the MDG-1, which is eliminating poverty. Beyond increasing the volume of the service utilization, the public health policies should focus on the question of which segments of population use maternal health care services. In a similar vein, women with higher levels of education are found to use more maternal care in most of the studies. This finding is not surprising as women with higher education are expected to be more aware of the benefits of maternal health care, and they may also have more bargaining power in the household, which may directly affect their utilization rate (Thomas 1990; Goland et al. 2012). In addition to education, urban/rural residence, ethnicity, and female autonomy are all found to be the main factors contributing to inequity. All these factors suggest that focusing on eliminating the differences arising from social status should be the principle challenge of policy-makers in order to avoid inequity in utilization.

The long-term goals in reaching the MDG-5 and reducing inequities in maternal care utilization are quite clear. These are diminishing income and regional disparities and increasing the level of women's education in developing countries. However, reaching these goals would take more than decades, and; hence, there is a severe need for short-term goals. In this regard, the most common policy implication provided by the reviewed studies is consumer-led demand-side financing systems (CL-DSF) such as cash transfer, voucher schemes, removing user fees, which have already been adopted in a number of developing countries such as Bangladesh, Cambodia, India, Kenya, and Pakistan, should be implemented in order to eliminate socio-economic barriers to the utilization of maternal health care (Ahmed and Khan 2011; Agha 2011; Quayyum et al. 2013). Furthermore, reviewed studies suggest combining equity-oriented health policies with social development programmes (Sepehri et al. 2008); improving social policies, which aim for women's empowerment (Kamiya 2011); reducing poverty and implementing supply-side interventions (Rahman et al. 2011; Hajizadeh et al. 2014). Increasing the number of facilities or birth attendants especially in the rural area is of further importance. Additionally, most studies indicate that awareness is an important factor affecting utilization of maternal care services; media and maternal education programs should thus be employed (Birmeta et al. 2013; Bbaale 2011; Målqvist et al. 2013; Limwattananon et al. 2010; Rahman et al. 2011). However, it should be kept in mind that these interventions and any other solutions should be by country and even region-specific. For example, Chowdhury et al. (2006) indicated that, the introduction of facility-based care in rural Bangladesh widened the rich-poor gap in utilization of ANC. Therefore, one important policy implication that can be inferred from this review is that, with global aims, countries should develop unique solutions.

The final recommendation would be the encouragement of developing countries to improve data collection and research. From the total of 36 empirical studies they were

found in three of the most comprehensive databases that underlines the fact that a limited number of quantitative analyses focusing on equity in maternal care utilization have been conducted for developing countries. Furthermore, most of the existing studies have focused on the same countries. On the other hand, one of the most important findings of this review is that the studies focusing on equity in maternal care utilization generally do not employ sophisticated econometric techniques, which are strongly needed to explain the complex nature of equity. For example, using panel data methods, which allows for analysing units over time rather than one point in time, may reveal the progress of equity over time. However, this depends on the availability of the relevant longitudinal data. Similarly, the binary choice models rather than logistic regression may be alternative methods to explore the existence of equity. All these features of the existing literature reveal the need for further studies exploring the existence of equity in maternal health care utilization. The studies should investigate the factors contributing to inequity, the progress of equity over time, and the effects of different interventions on equity by using more sophisticated econometric techniques especially for the countries that have never been studied before.

Finally, it is important to acknowledge that there are some limitations of this review. First, the strategy used for the identification of studies might lead to the exclusion of some relevant papers. Although we have done the reference list check, we have missed some relevant papers published in other languages since we include papers only written in English. Second, even though the search terms for maternal health care utilization are chosen in a wide range, since indicators of maternal health care can be defined with a broad range of terms, it is still possible to exclude a few studies employing different terms in their studies. Further, excluding studies without empirical analysis might seem to narrow the scope of the review; however, considering the aim of this study—which is evaluating equity- such exclusion may be seen as necessary. Even though the outcome measures can be brought together in a wider respect (maternal health care utilization), the heterogeneity of the outcome measures and methods employed, further the socioeconomic differences between countries included in the review made performing a meta-analysis insignificant, and; hence, a narrative systematic review is carried out instead.

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