Summary

China recently reported that the Millennium Development Goal (MDG) target 66% reduction of under-five mortality has been achieved well ahead of schedule, and that the target 75% reduction in maternal mortality should be achieved by the deadline of 2015. This paper provides data on the dramatic convergence of rural and urban under-five and infant mortality rates (U5MRs and IMRs) and the maternal mortality ratio (MMR) in China, over the 20 years since the 1990 MDG baseline, as an example of how China is progressing on the MDGs with equity. U5MR and IMR have both fallen slightly faster in rural areas than urban, and MMR has fallen much more in rural areas. Similar changes have occurred if a comparison is made between mortality in the developed east and less developed west of the country. These changes have occurred predominantly in the last decade, and despite a 25% increase in urban/rural household income disparity. The drivers of this progress on reducing child and maternal mortality with equity are examined.

The related legal and policy environment, strengthened in the 1990s has been very influential on ensuring that national and local priority is given to maternal and child health (MCH). China had National Plans for Children and Women with mortality targets well before development of the MDGs. Public communication, technical, training and service quality improvements across the three tiers of MCH care also ensured steady reductions in child and maternal mortality during the 1990s.
But the real pro-poor initiatives, benefiting particularly the poorest rural children and women began in the last decade, including massive government initiatives to insure the population and additionally to subsidise the cost of rural women delivering in hospitals. The rural cooperative insurance scheme, a voluntary, contributory scheme heavily subsidised by national and local government, has a membership of almost 95% of the rural population, and co-funds MCH and delivery services in most rural counties. Hospital delivery subsidies have been expanded from around 400 to all 2297 rural counties since 2000, and have stimulated increases in hospital delivery and falls in MMR in beneficiary counties at rates much faster than the national or rural averages.

More recently, increased funding for and structural and other broad improvements to China’s health sector have been introduced as part of a broad reform of China’s health sector; these also have a strong equity focus. China’s low fertility rate and progress in non-health sectors, such as education, water, sanitation and integration of ethnic minorities has also played a role. Overall socio-economic progress across the nation has also almost certainly had an impact in providing a foundation for government capacity to introduce changes and household uptake thereof.

All this should not infer the absence of challenges to progressing further, with equity, even after the MDG targets have been met. There remain major sources of inequity in the distribution of financial and human health resources in China, both geographically and within the health sector itself. In addition, access to a basic set of services, particularly for marginalised groups, is not yet universal in China, and new challenges, such as ensuring access to care for urban migrants and their families and reducing the risk of the urban poor to certain types of non-communicable diseases, are high priorities. Finally, the Chinese government depends heavily for financial support for and the prioritisation of MCH by local governments at all levels.

**Introduction**

China recently submitted its 2010 Report on Progress towards the Millennium Development Goals (MDGs), in which it reported that the target 66% reduction of under-five mortality has been achieved well ahead of schedule, and the target 75% reduction in maternal mortality should be achieved by the deadline of 2015.

Given the size of China’s population, and the wide variety of socio-economic, demographic, geographic and ethnic groups in this country, the progress on these two MDGs has been very pleasing. In addition, China is aware of its enormous importance on the regional and global scorecards for these two and all the other MDG indicators, and its possible influence on other developing nations who may seek to learn from China’s experiences or emulate its strategies.

This short paper has therefore been written to provide further background on China’s progress towards achieving the MDG 4 and 5 targets on child and maternal mortality with equity, for participants at the High-Level Meeting of Asia Pacific Leaders on Child Rights being held in Beijing in November 2010. The paper draws from China’s 2010 MDG Report and also closely follows the

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related presentation given at the meeting. However, it also provides more detailed information in some areas, and resources for those who wish to read further.

Analysis of China’s progress in reducing disparities

In 1990, although firmly established on the “demographic transition” away from communicable diseases being responsible for the majority of deaths, the maternal and child health (MCH) situation in China was still definitely characterised by massive disparities in the rates of child and maternal death between the poor rural west of the country and the relatively wealthy, industrialised east.

The following three figures depict the scale of disparities in child and maternal mortality between rural and urban areas\(^2\). They also show the dramatic convergence of rural and urban under-five and infant mortality rates (USMRs and IMRs) and the maternal mortality ratio (MMR) in China, over the 20 years since the 1990 MDG baseline. As is observed in most nations with a low USMR, the majority of under-five deaths (around 80%) occur in infancy (before age 12 months), and in particular (over 50%) in the newborn period (from birth to age 28 days). Note that maternal mortality, a relatively uncommon event, is defined by convention as maternal deaths per 100,000 live births. Additional discussion of the data sources and specific issues about the data is included in an Annex.

![Under-five mortality rate, 1991-2009](image)


**Figure 1:** China’s overall, rural and urban under-five mortality rates, 1991 – 2009, and the linear trendline required for achievement of the related MDG 4 indicator

\(^2\) This paper mainly focuses on the mortality differences between rural and urban areas, but data also available shows similar trends if we compare the developed east of the country with the less developed western provinces. Figure 5 below, also compares related indicators for counties grouped by socio-economic status, and again shows dramatic reductions in inequity on these.

Deadly per 1,000 live births

Ministry of Health, China Health Statistical Digest, 2010 (2009 data)

Figure 2: China’s overall, rural and urban infant mortality rates, 1991 – 2009


Deaths per 100,000 live births

On track, rural-urban gap decreasing.

Ministry of Health, China Health Statistical Digest, 2010 (1990, 2009 data)

Figure 3: China’s overall, rural and urban maternal mortality ratios, 1991 – 2009, and the linear
trendline required for achievement of the related MDG 5 indicator
The observed convergence infers two things: first, that the number of deaths amongst rural children and women has fallen dramatically and consistently, with some exceptions (such as the USMR in 2008, probably due to the impact of the Sichuan earthquake); and second, that deaths in rural areas have fallen at a faster rate than deaths in urban areas. A closer look at the data verifies that the ratios of rural:urban death rates have indeed fallen for all three indicators: from 3.4 in 1991 to 2.8 in 2009 for the U5MR; from 3.4 in 1991 to 2.7 in 2009 for the IMR), and from 2.6 in 1991 to 1.3 in 2009 for the MMR. The fall in the ratio of the rural:urban MMR is particularly large, and is said to be unprecedented in the world.

Another closer look at the three graphs also suggests particular progress in this reduction of inequity in rural versus urban child and maternal mortality in the decade since approximately the year 2000. This has occurred despite a gradual rise in inequity in the urban:rural distribution of household income over the same period. Figure 4 compares the three rural:urban mortality ratios with the urban:rural household income ratios from 1991 to 2009. Urban:rural household income disparity increased from 2.4 in 1991 to 3.4 in 2009, and by more than 25% in the last decade.

![Figure 4: Trends in the ratios of rural/urban U5MR, IMR and MMR, and urban/rural household income, in China, 1991 – 2009](image)

What then, were the main factors behind this reduction in disparity, and to what extent has the Chinese government been able to pursue its stated focus on scientific approaches to development and reducing inequities, particularly over the last decade? An analysis of the various influences is provided below.
Drivers of improving equity in China’s child and maternal mortality

1. Policy support

Over the past 30 years, the process of reform and opening up in China has brought economic prosperity to the country, and also helped to improve MCH care. The Chinese Government has attached great importance to MCH, and has incorporated these issues into national development strategies. It has also promulgated a series of relevant laws, statutes, regulations and policies, and has gradually established a legal system that provides solid legal guarantees for the protection of the rights and interests of China’s children and women, in relation to their health status. These documents include the 1994 Law on Maternal and Infant Healthcare, the 1992 Law on the Protection of Women’s Rights and Interests, the 2001 Population and Family Planning Law (itself an evolution of the family planning policy introduced in the late 1970s), Management Regulations for various MCH-related Technical Services and the multisectoral National Plans of Action (NPAs) for Children and for Women (1991-2000 and 2001 – 2010).

The 1994 Law on MCH in particular has proven to be a highly effective intervention by the authorities of the day. It mandated local governments to:

- Prioritise resources for antenatal and newborn care;
- Ensure that all health workers are appropriately qualified, and
- Give special emphasis to improving affordable services in poverty stricken areas.

Moreover, well before the world established the MDGs, the targets and strategies established in China’s NPAs have provided a multisectoral framework and goals for the various agencies involved in ensuring access to MCH services and positive outcomes. In addition to the national program, as of 2003 all provinces, 98% of prefectures and 99.5% of counties had established their own child development plans. The next NPAs, for 2011 – 2020, are now in the final stages of preparation by China’s State Council National Working Committee for Children and Women.

Finally, in relation to policy support, during recent years China has been undertaking comprehensive health system reforms, one pillar of which is striving to establish a basic healthcare system that ensures access to quality health care, including MCH care, in both urban and rural areas, far and wide. The reforms are deeply focused on reducing disparities in access to and uptake of care, and are being avidly applied all over the nation, but it is too early to assess their impact in this regard.

2. Funding and strategies

The marketisation of China’s health sector in the 1980s and 1990s was widely acknowledged to have caused deep inequities in access to preventive, primary and clinical care (including in MCH care), and the risk of impoverishment due to catastrophic health expenditure. Over the last decade, two major initiatives commencing before the current health sector reforms sought to address this situation, and have had an impact on reducing inequity in child and maternal mortality in China.

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First, beginning in the late 1990s, the government introduced a health insurance scheme for urban employees, and later mobilized a range of social resources to partially underwrite new urban and rural health insurance schemes for all. Contributions to the reinvigorated rural cooperative medical scheme (RCMS), a voluntary and contributory scheme heavily subsidised by national and local governments, totalled 94.4 billion renminbi (around US$14 billion) in 2009. Similarly, schemes for urban residents and employees have also been expanded to reduce financial risk. Overall health insurance coverage in China increased from 22.1 to 87.1% from 2003 to 2008; in rural areas RCMS coverage increased from 12.7 to 94.2% from 2003 to 2009. Although the schemes do not yet provide adequate cover for preventive and primary care, only cover a proportion of the cost of inpatient care, do not always cover the family members of urban employees, including their children and do not yet cover many urban migrants, their popularity and the gradual reduction in the proportion of total health expenditure funded out of patients’ pockets suggests they are having a positive impact on improving financial access to health services. (Out of pocket expenditure on health care, only 20% in China in 1980, rose to almost 60% by 2000, but is now falling steadily.\(^4\)) National survey data indicate that this impact has been most positive on those who need the most financial support – the rural poor. In addition to these insurance schemes, the separate, government-funded medical financial assistance scheme supports poor families faced with financial ruin due to the cost of expenditure on catastrophic illness.

Second, the most tangibly equity-focused initiative in the area of MCH has been subsidised hospital delivery for women in rural areas of China. First piloted with support from UNICEF in 40 counties in the late 1990s, these subsidies were introduced by government in 378, high-MMR rural counties in 2000, with an allocation of 10 million RMB. The scheme, which provides standard amounts to subsidise normal and operative hospital delivery, was progressively expanded to 428 counties in 2002, 1000 counties in 22 provinces in 2005 and 1200 counties in the same 22 provinces in 2007, always focusing on those with the highest MMR and rates of rural poverty. In 2008, the central government allocated 1.9 billion RMB for such subsidies in all central and western rural counties, and since 2009, women in all 2297 rural counties in China are eligible for subsidised hospital delivery, as one element of the health system reforms. In addition, all rural counties and urban districts have introduced a system in which the entire cost of antenatal care, early post-natal care (up to a fixed amount, but adequate for most deliveries) and child health monitoring are funded by a combination of these subsidies and local and other central government contributions.

In general this scheme has been a resounding success. China’s hospital delivery rate increased from 73% in 2000 to 96% in 2009. Hospital delivery increased by 48% and maternal mortality decreased also by 48% in counties covered by the scheme from 2001 – 2007, both much faster than the national rates of change for these indicators. A recent peer reviewed evaluation found a statistically significant and causal association between the scheme’s support for hospital delivery and reduced maternal mortality\(^5\). In addition, to the extent that the scheme has also reduced newborn deaths, which are responsible for more than 50% of under-five deaths and almost 70% of infant deaths in China, it has also reduced the rural:urban ratio of U5MR and IMR, particularly since around 2002.

More recently, in line with the current health sector reforms, the Chinese government has gradually increased the proportion of total government expenditure on health, from 0.8% in 2006 to 1.4% in 2009. Part of this increase is now funding 15 yuan per capita for public health initiatives in rural areas; these funds are administered locally according to need and can be augmented by inputs from local government; they are often used to subsidise antenatal and other MCH care. The payment will increase to 20 yuan in 2011. In addition, a major program of construction of health facilities at village, township and county level is being undertaken, again prioritising poor rural areas. There are now over 3,000 MCH centres nationwide, employing 500,000 health workers across a three-tier network of county, township and village-level services.

This three-tier network is another foundation of China’s MDG 4 and 5 “success with equity”. Building on the hierarchy established in the 1960s when China’s famed “barefoot doctors” were introduced, MCH services across China now comprise village level health promotion, screening and basic clinical services; township-level antenatal and post-natal care, skilled attendance at delivery (usually that defined by the international standard for basic essential obstetric and newborn care) and standardised management of childhood illnesses (often including the integrated management of childhood illness or IMCI approach) at township clinics and hospitals, and referral level care with operative delivery, blood banking and advanced newborn services and clinical child health care, at county level. Although there is a wide range in the level of qualification of the personnel available (recently reviewed⁶) and in the standards of care provided in different parts of the country, the principle of ensuring a deep penetration of trained health staff, equipped with drugs and diagnostic equipment appropriate to their level, is firmly established in China, and provides almost all children and women in the country with access to a basic level of MCH care.

3. Earlier initiatives

Up to now, this paper has focused mainly on schemes and improvements introduced or expanded over the last 10 years. Given the focus on equity, this is appropriate, as the decreases in the rural:urban ratios of child and maternal mortality have occurred during that period. However, given that there were very large numeric disparities in rural versus urban mortality at the 1990 MDG baseline, that these mortality rates fell at approximately the same rate in both rural and urban areas throughout the 1990s, and that urban MCH services have improved to the extent that mortality rates in the wealthiest cities are now lower than in most developed nations⁷, it is worth mentioning several earlier influences and initiatives that have impacted on rural mortality in China.

The first is the practical implementation of the 1994 Law on Maternal and Infant Health Care, which primarily impacted on rural areas as mentioned above.

The second is the upgrading of technical skills and capacity in many rural clinics during the 1990s and continuing into the new millennium. Blood-banking, active management of the third stage of labour and hypertension in pregnancy; standardized approaches to neonatal resuscitation, management of pneumonia and diarrhea, and injection safety were all expanded during this period. In addition,

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China has continued to maintain and improve the skills of grass-roots and county-level MCH staff through the MCH network that oversees the provision of outpatient MCH care as well as providing a varying degree of inpatient services in most counties. The construction program already mentioned includes many new or renovated MCH facilities.

Third, public communication on health, including MCH, has expanded throughout this period. In 1994, the government introduced a communication initiative entitled the “Hundreds of Millions of Farmers Health Promotion Action”, joining six ministerial level authorities in a set of coordinated activities. This project, which continues today under the guidance of the Ministry of Health, has delivered information on the scientific foundation of good health to the rural poor, as well as stimulating many local participatory health education activities in rural areas.

The impact of these and other initiatives and contextual factors on antenatal care, hospital delivery rates and post-natal care, even before the subsidies and revitalized insurance schemes described above, is evident in figure 5, which shows dramatic increases in all three in the poorest (see red arrows) and second poorest (green arrows) two “quintiles” beginning as long ago as the mid-1990s.

![Figure 5: Increases in hospital delivery, antenatal and post-natal care by urban-rural typology in China between 1993 and 2008](image)

4. Other determinants

The WHO Commission on Social Determinants of Health has drawn considerable attention to broader, contextual influences on all aspects of health. China’s MCH is unlikely to be any different. A recent attempt (as yet unpublished) by a group of high-level Chinese and international academics to compare the influence of a wide variety of social, political, health and economic factors concluded

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that collectively the social factors had the strongest correlation with reductions in child mortality in this country – even more than specific health interventions.

The key determinants in this analysis included China’s renowned low fertility rate, high rates of maternal education, access to safe water, improvements in sanitation and integration of minority populations. Most of these are either intuitively obvious and/or have been independently evaluated and found to have a strong association with MCH indicators elsewhere, particularly maternal education. Moreover, China does not advocate a one-child policy for all nations and this policy does not apply to all of China’s families. But there is no question that China’s low fertility has had a major positive impact on MCH mortality in this country, and that child-spacing and reduced fertility are both associated with lower rates of child and maternal mortality around the world. Finally, China’s pro-poor improvements in the other key determinants, water, sanitation and integration of ethnic minorities, are evidently having the desired effect. Overall socio-economic progress across the nation has also almost certainly had an impact in providing a foundation for government capacity to introduce changes and household uptake thereof.

This analysis of China’s experience suggests that achieving MDGs 4 and 5 with equity involves more than a health focus. China’s development efforts have, of course, involved all sectors, but an analysis of other sectors goes beyond the scope of this paper and has been undertaken elsewhere.

Challenges on the provision of MCH services with equity, in China

Notwithstanding the policies, funding initiatives and strategies described here, the Chinese government acknowledges the outstanding challenges to providing health services for children and women with equity. Most of these challenges are not unique to this country and have been mentioned already: disproportionate funding of hospitals rather than community services, and disproportionate distribution of health human and financial resources in urban areas and in eastern versus central and western provinces; gaps in birth registration and services for some marginalised groups of children, such as those who are homeless, migrant or left-behind in rural areas with elderly relatives, the disabled or those affected by HIV; lack of universal early child development screening and services for those with problems in rural areas; remaining access and uptake problems for remote and ethnic minority children and women, and failure to adequately address the new challenges of an increasingly urbanised society, such as higher risks of certain types of injury and the rise in overweight and obesity, both of which impact most heavily on poor urban children and their families.

The Chinese government, through its health system reforms and other independent initiatives, is working to address these issues, but depends heavily on adequate implementation of national policies and strategies, and funding, by local authorities. It takes time, money and a lot of effort. The trends are positive, but more and high quality evaluation, including a specific focus on the lowest socio-economic groups, is required.

11 China National Human Development Report, 2007-8. Basic Public Services for 1.3 Billion People
Annex: Additional comments on the data

This Annex provides some information on the data sources, and explains in more detail why the observed trends are important.

China’s child and maternal mortality data derive from two main sources, the MCH Annual Administrative Reports (county-level summaries of mortality data reported by health staff at village- and township-level) and the more closely supervised National MCH Surveillance Network (standardised, on-line reporting by trained staff, now in around 12% of China’s counties). The quality of data inevitably varies, but the general messages are very likely to be accurate, and recent reports compared changes in China’s MMR using these two data sources and found that they yield similar results. However, there are two interesting considerations on the conclusion, based on relatively faster declines in rural mortality, that rural:urban MCH inequity is falling.

The first relates to the fact that it is usually easier to address common health problems (especially communicable or other diseases for which mass prevention or simple, cheap treatments are available) than less common or non-communicable diseases needing individual and often more expensive approaches. The commonest causes of child mortality in the 1990s in rural China, where the demographic transition was less advanced, were pneumonia, diarrhoea and preventable newborn illnesses, different from those prevailing in developed urban areas, such as prematurity, congenital abnormalities and other illnesses such as cancer. Although China does not have adequate data to prove it, it seems intuitive that for a given rate of development, faster progress would be made in rural areas, against easily treatable causes of death, than against more difficult causes in urban areas. This may partly explain the observed decline in rural:urban inequity, but does assume similar rates of economic and health system development; this may not be a valid assumption. More rapid progress in the availability of high quality MCH care in urban areas may have enabled a rapid rate of decline in less common causes of child and maternal mortality there. Accordingly, the equity gains in the last decade are all the more remarkable.

The second is somewhat contrary to the first, and refers to uncertainty on the different mortality rates amongst formally registered urban residents (those with an urban “hukou” permit, which until recently conferred easier access to and better care) and urban migrants whose residency status is less certain, or who are simply not registered and thus less able to access health care in the city.

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where they fall ill. It is likely that overall urban mortality rates are increased by deaths amongst temporary migrants in urban areas, and that mortality amongst formally registered or permanent urban residents is much lower than the observed urban rates. Although it is unlikely that urban migrants would have death rates as high as in their place of origin (as the standard of care in urban areas is generally higher, as it is almost anywhere in the world), this would have the effect of exaggerating the observed declines in rural:urban mortality ratios. This is most noticeable in figure 3, where we can see that China’s urban MMR has not decreased for almost 15 years, a very unlikely situation given improvements in the quality of care in China’s urban maternity units.

Obviously this reflects a separate challenge for China, namely ensuring access to and uptake of the same level of care for all urban-dwellers, whether permanent or temporary, particularly in the context of massive and rapid rural-urban migration, possibly at a rate outstripping local authorities’ ability to provide high quality and well-regulated new services.

Overall, the improved equity China has achieved merits additional analysis, to better guide strategic approaches to prevention of child and maternal mortality and allocation of related human and financial resources. Meanwhile, we can safely assume that certain initiatives and factors have played major roles in the reductions of disparity observed. These are examined in the body of this paper.