**Supplementary file**

Box 1 Mozambique and Maputo city

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| Mozambique is a low income country in Sub-Saharan African region with 25 million population. After the long civil war ending in 1992, Mozambique economic development gradually recovered (International Monetary Fund, 2010)*.* In 2010, two thirds of population lived in rural areas and half was defined to live under the poverty line. Population health improved, with the exception of a severe HIV epidemic. A general population survey reported 11.5% of HIV-prevalence at national level; Among pregnant women aged 15-49 attending antennal care clinics, HIV-prevalence was 15.8% in 2011 (Conselho Nacional de Combate ao HIV e SIDA (CNCS), 2014). The maternal mortality ratio decreased from an estimated 910 deaths per 100,000 live births in 1990 to 490 in 2010 (WHO, UNICEF, UNFPA and The World Bank, 2012).  Maputo city is the capital of Mozambique located in the southern region. It has more than one million residents. In Maputo, societal and health indicators are notably better than in Mozambique overall. In 2012, the GDP per capita was almost double of the average national level (US$ 1,153 versus US$ 593) and illiteracy rate was only 6% versus 33% nationally (National Institute of Statistics of Mozambique, 2013). Due to the civil war, Maputo was isolated until 1992 and HIV arrived there late (Dgedge et al., 2001), but it spread rapidly. In a cohort of pregnant women in 2006-2008 in Maputo, the HIV-positivity was 20% (Hemminki et al., 2016). Maternal mortality ratio was 364 per 100,000 live births in 2010 compared to that of 490 nationwide (National Institute of Statistics of Mozambique, 2013). |

Box 2 Health services in Mozambique

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| The state organised and administered health services in three levels: national, provincial and district levels. Ministry of Health (MOH) controlled and guided health services, e.g. by money and by deciding health professionals' work places. In addition to the public system, there was a non-profit private sector. It was funded and run by a number of international non-governmental organisations and religious entities and overseen by MOH. Much of their activity had been on community health programmes and many activities were related to HIV/AIDS. Private for-profit sector started to develop in the 1990s. Nationwide it was still small, concentrating in big cities, particularly Maputo city. Private for-profit health services were not planned. To establish one, permission from the local health directorate was needed. In addition, there also co-existed informal healthcare, such as traditional medicine practitioners.  The public health system had four level health facilities (Figure S1). Level I included health centres and health posts providing basic primary health care. They accounted for 96% of all public health facilities. The staffing and functions of health centres depended on the area, but usually health centres were staffed with unspecialised physicians and nurses. Level II included district and rural hospitals (around 41 hospitals) providing first level referral care, emergency care and surgeries. They also provided technical support to and supervised Level I facilities in their areas. Level III included seven provincial and Level IV three central and two specialised hospitals; they provided specialised care and acted as referral places.  Administratively health centres were under district and rural hospitals and health posts were under health centres. Level II hospitals were not subordinate to higher level hospitals, but were under different administrative structures (district directorates). |

Box 3 Maternity care in Mozambique and Maputo city

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| The national health plan for 2007-12 emphasised both improving the health status of the population and strengthening the capacity of health service delivery. One of the specific objectives was to reduce maternal mortality ratio. Strategies to achieve this included provision of a continuum maternity care and family planning services and prevention and treatment of infectious diseases such as HIV and malaria (Ministerio da Saude, 2008a).  Maternity care was organised in the same way as health care in general. Health centres and health post provided prenatal care and family planning services. Three centrally designed (by the MOH) packages on preventive interventions and on essential and emergency obstetric care stipulated that all pregnant women should have at least four prenatal visits and two postnatal check-ups and guide care contents. There had been substantial efforts to provide comprehensive obstetric care, supported by a number of international donors (Jamisse et al., 2004; Santos et al., 2006).  In rural areas, basic obstetric cares were available at health centres. In urban areas, Type A health centres provided prenatal care and basic obstetric care, such as vaginal delivery, Type B health centres provided only prenatal care including consultation, physical check-up, routine tests, some targeted tests and treatment (e.g. HIV/AIDS, TB and malaria), immunizations and family planning services. Comprehensive and emergency obstetric cares (e.g. C-section) were provided by secondary and higher level hospitals.  Health professionals providing maternity care included maternal and child health nurses (MCH nurses), midwives, general practitioners, surgery technicians, mother health nurses (with higher level education) and specialists in obstetrics & gynecology (Table S1). The entry requirements and length of education varied. Technicians had a three-year education with specific training to do surgery, and obstetric specialists were few (Bergström, 2015). For 2010 it was estimated that Mozambique had 4106 practicing MCH nurses, 58 surgery technicians and 40 specialists of gynaecology & obstetrics (Ministério da Saúde, 2011).  The tasks were to be divided by the level of education, but the low numbers of professionals in relation to the need, had resulted mixing of tasks. Surgery (C-section) had however been restricted to physicians, technicians or specially trained mother-health nurses.  According to Demographic and Health Survey (DHS) in 2011, the percentage of women with 4 or more prenatal visits was 50.6%. This was higher in urban areas (59.5%) than in rural areas (46.9%). In 2011, 54.6% of women gave birth in health facilities which ranged from 27.8% in Zambezia to 91.4% in Maputo city. Cesarean section (CS) rate was 4.7% in 2011 and it was also the highest in Maputo city, 20.5% (Long et al., 2015).  Compared to other provinces, Maputo city was better resourced with health personnel and facilities. Health facilities in Maputo city had completed reconstructions and refurbishments before 2000. Problems of having energy or water were rare; many high level health facilities had their own reserve generators in case of electricity cut. But lack of supplies occurred sporadically.  At the time of the study, in Maputo women with visible pregnancy or proved by medical tests were eligible for prenatal care and most women used it. Women were advised to come to prenatal care from 3 months pregnancy onwards. HIV testing was routinely offered and treatment with antiretroviral drugs was to be given to HIV-positive women. |

Box 4 Health care financing in Mozambique

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| The largest funder of public health services was international donors (Figure S2). Estimates of donor financing varied from 50% to 75% of all health system costs. Around 73% of total expenditure on health in Mozambique was from donors in 2009 *(*the East, Central and Southern African Health Community(ECSA-HC), 2011). Taxes were the second source. Other smaller financers were public sector employees’ co-payment and user fees. Public sector employees contributed to the Medical Assistance and private employees contribute to social co-payment schemes. Both schemes provide reimbursement for the treatment, but the benefit packages were often limited.The public health sector provided free or low cost care and out-of-pocket expenditure was generally lower than 15% of the total health expenditure between 1997 and 2009 (ECSA-HC, 2011)*.*  Ministry of Planning and Finance (MPF) managed the state budget and allocated money to different sectors, including health.MPF distribute the money to health facilities and drug procurement agency, via Treasure-Unique Account, by the orders from MOH. The role of MOH in finance was strengthened by the fact that most donor money went directly to it, as a part of common fund.  Administratively goods (e.g. drugs, equipment, and food) followed the same decision route as money. But physically goods were stored is specific depots. For drugs there was a national drug depot. From there drugs went to provincial drug depots, which distributed them to pharmacies of health facilities, which further distributed them to the pharmacies of maternity units. |

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