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Mothers and Children: Designing research toward integrated care for both

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Abstract

The Millennium Development Goals (MDG) set time-bound targets that are powerful shapers of how and for whom health is pursued. In this paper we examine some ramifications of both the temporal limitation, and maternal-child health targeting of MDG 4 and 5. The 2015 end date may encourage increasing the number of mass campaigns to meet the specific MDG objectives, potentially to the detriment of a more comprehensive approach to health. We discuss some ethical, political, and pragmatic ramifications of this tendency, and show that these are not unique to the MDGs but rather have a long history in health policy debates. We also examine attempts to counter a narrow focus on vertical interventions in campaigns through integrated health system delivery platforms. We argue that the way forward is not to assume that evidence is value free, but rather to make explicit the political and ethical decisions in the design of metrics and evaluation research. We propose an index of five factors that should be included in research designed to inform decision making about providing interventions as part of routine services or periodic campaigns, toward serving more members of the population, and long-term strengthening of the health system via integrated health interventions.

Keywords: ethics; health service delivery platform; history of medicine; public health; maternal and child health; mass campaigns; Millennium Development Goals; routine health services.

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I. Introduction

Millennium Development Goals

Goal 4: Reduce child mortality rates

Target 4A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate

- Under-five mortality rate
- Infant (under 1) mortality rate
- Proportion of 1-year-old children immunized against measles

Goal 5: Improve maternal health

Target 5A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio

- Maternal mortality ratio
- Proportion of births attended by skilled health personnel

Target 5B: Achieve, by 2015, universal access to reproductive health

- Contraceptive prevalence rate
- Adolescent birth rate
- Antenatal care coverage
- Unmet need for family planning

How is health – a state of being, a human right, a fundamental good – turned into a goal? In the year 2000, all member states of the United Nations agreed to eight Millennium Development Goals (MDGs) for the reduction of poverty. Of these, two deal specifically with the health of mothers and children, while the other six deal with related challenges such as HIV/AIDS, and aspects of life that relate to or function as social determinants of health (although those goals, from education to access to clean water, in fact have their own advocates, researchers and politics). Turning goals into plans meant selecting aspects which could be quantified, so that progress could be measured. This transformation was a process shaped by a multitude of decisions that were as much ethical and political as scientific and medical.

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Setting goals is clearly a process of elimination, in which some things are included and others left out. Less evidently but no less powerfully, so is the design of metrics, and their implementation in the evaluation of policies and programs. As one of the architect of the MDGs noted, "measurability is important, not for statistical but for political reasons. Measurement influences public action and shapes the political debate." (Vandemoortele, 2011: 11-12). Creating metrics requires choosing what will be measured, which is to say, what counts. The tools, no less than the goals, are the result of judgments. While evidence can indicate what is true and what is false, such as which intervention saves more lives at a lower cost, it cannot indicate right and wrong, such as choosing which lives should be saved. "There is no objective way of using the scientific method…" one passionate commentator wrote, "to select this rather than that illness for action, to say that the death of a child is somehow worse than that of an adult, or to selectively direct public resources to one set of individuals rather than to another. These are inevitably value judgments" (Newell, 1988). Such selections were of course inherent to setting the Millennium Development Goals.

In this paper we examine how the design and implementation of Millennium Development Goals 4 and 5 compel decisions to be made about how to provide health care, and to whom. MDG 4 aims to reduce under-five mortality by two-thirds between 1990 and 2015 (United Nations, 2001). MDG 5 seeks to (A) reduce the maternal mortality ratio by three-quarters during the same period, and (B) achieve universal access to reproductive health (United Nations, 2007). Target B was officially added in 2008 after a bitter battle for acknowledgment of the importance of comprehensive family planning for preventing unplanned pregnancies and allowing spacing between births to overall maternal health (Hulme 2010).

We first examine one way that the year 2015 deadline of the MDGs plays out on the ground, namely, in terms of the much older conflict between putting resources toward strengthening basic health care services or increasing the number of mass campaigns to provide interventions addressing high-impact diseases (Gonzalez 1965). The temporal limitations tend to incentivize a narrow focus on vertical interventions, yet there are efforts to diversify that approach through integrated health system delivery platforms, which we examine in relation to MDG 4 and 5. We show that political and pragmatic ramifications of time-bound targets are not unique to the MDGs, rather, they have been taken up in historical debates in health policy. We argue that the way forward is not to assume that evidence is value free, but to make explicit the fact that the design of metrics and evaluation research includes decisions with political and ethical ramifications. Toward that modest goal, we propose an index of five factors that should be included in research intended to informs decision making about investing in routine services or periodic campaigns, toward serving more members of the population, and long-term strengthening of the health system via integrated health interventions.

II. Campaigns versus Routine Services

Progress on MDG 4 and MDG 5 has been made in global terms, with a decline from 11.6 million under-five deaths in 1990 to 7.2 million under-five deaths in 2011, and a decline from about 410,000 maternal deaths to 270,000 maternal deaths during the same period (Lozano et al., 2011). Yet these hopeful numbers hide extreme disparities. In many places neither Goal 4 nor 5 is on track to be met (Bhutta et al., 2010); mortality among children and mothers remains especially high in sub-Saharan Africa. Milestones or time limits are necessary at least for the possibility of national or United Nations accountability to exist, as well being basic to setting up

a schedule, general organization, and motivation. However, having an end date for the Millennium Development Goals shapes what policies can be implemented to feasibly achieve them. The deadline can serve to justify, deservedly or not, a reliance on stopgap campaigns over the provision of routine health services that may be more costly, up front, in terms of time and money.

The goal of comprehensive primary health care for all (WHO, 1978) is accepted as above reproach (Walsh and Warren, 1979); this should include "promotive, preventive, curative and rehabilitative services" (WHO, 1978). In the long term, strengthening health systems to provide such care to the whole population would also best meet MDG 4 and MDG 5. A "health system" can be understood most generally as the sum of the ways that health care is provided, "the combination of resources, organization, financing and management that culminate in the delivery of health services to the population" (Roemer, 1991). This does not mean top-down coordination or organization though. As set by WHO, the goals (and hence associated metrics) of health systems include improving health, being responsive to the expectations of the population, and having an equitable structure for health-related financial dues (WHO, 2000; Murray and Frenk, 2000). "Strengthening" indicates no specific mechanism. It could mean building community clinics or high-tech hospitals, increasing the number of skilled birth attendants, or creating new mechanisms for health care financing.

Immunization programs are, however, the only relatively stable service provided by the health system in certain low- and even middle-income countries. That immunizations are available is due in large part to the combined effects of the World Health Organization's Expanded Programme on Immunization (EPI) launched in 1974 (Keja et al., 1988), the UNICEF "Universal Childhood Immunization by 1990 Initiative" (UCI) launched in 1984 (Hardon & Blume, 2005), and the Global Alliance for Vaccines and Immunization (GAVI) started in 1999 (www.gavialliance.org). Campaigns, among other efforts, are launched to vaccinate marginalized subpopulations through the EPI, and by countries on their own, to get those individuals who were missed.

Mass campaigns targeting children and adolescents may be called "Child Health Days," "National Immunization Days," or more specifically for measles, "supplemental immunization activities" (SIAs). These last a few days to a few weeks, during which time teams of health care workers use temporary mobile facilities to target children and adolescents who do not have regular access to health services. Child Health Days can range in spacing from yearly to longer, irregular intervals (Doherty et al., 2010). An adequate health care apparatus for vaccinating children (and providing reproductive health care) as part of routine primary care is clearly preferable to more precarious and erratic measures, but how to achieve adequacy is far from clear.

A policy of strengthening routine services presents specific advantages and disadvantages in situations of limited resources. The potential for a health system to provide services and accompanying benefits in lower income countries, at the level of high-income countries, would seem to meet requirements of fairness. However, given that building human capacity and infrastructure takes time and greater sums of money upfront, allocating resources to long-term projects does not preferentially target the most needy, and in the short-term is unlikely to reach them at all. A well-recognized problem with the campaign approach, on the other hand, is that this may substitute for strengthening routine immunization programs (Heymann, 2010; Hanvoravongchai et al., 2011).

The situation created by MDG time limits in many low-income countries is that a mad race to implement mass campaigns may be enacted. The issues raised by the MDGs recapitulate a significant debate which played out in the late 1970s about health, how to maximize it and for whom. Immunization against major infectious diseases was but one part of primary health care defined as inextricable from social, economic and political determinants in the 1978 Alma-Ata Declaration (WHO, 1978). Concerned that the wide-ranging goals of the idealistic Declaration would not be met, an alternative prioritization of high-impact interventions, called "selective primary health care" (SPHC), was suggested to improve the health of the greatest number of people given limited resources (Walsh and Warren, 1979). SPHC was proposed as an interim strategy, to be provided as-needed through mass campaigns, and focused on maternal and child health. This approach was widely adapted by international organizations, NGOs and some nations, leading to the accusation that the goal of comprehensive primary care had been subverted (cf. Newell, 1988).

The World Health Organization policy for measles control is a contemporary variant of the narrow focus on high-impact disease. The approach has focused on sustaining high coverage of routine immunization of children at about 9 months of age, and supplementing it with a second dose opportunity in selected priority countries (WHO, 2009a; WHO, 2010). In high-income countries, the second dose of measles vaccine is usually included in the vaccination schedule and administered to children before school entry. In low- and middle-income countries, an opportunity for a second dose of measles vaccine is more likely to be offered through supplemental immunization activities (WHO, 2009a).

The campaign delivery platform has much potential diversification. In the case of sub-Saharan Africa, the Child Health Days delivery platform usually provides oral polio vaccines (OPV), measles vaccine (MCV), vitamin A supplementation, and such deworming medicines as Albendazole and Mebendazole (WHO, 2009b). One specific example is that of South Africa, which has implemented SIAs within the polio national immunization days at the provincial level since 1996 (Uzicanin et al., 2002). In addition, most recently, insecticide-treated bed nets (ITNs) have begun to be distributed through the channel of these mass immunization campaigns (Grabowsky et al., 2005), which has enabled a scale-up in the use of ITNs in some Sub-Saharan African countries (WHO, 2011).

The provision of these basic services for children already represents an expansion of the original vaccine campaigns. Interventions included in a maternal health package tend to be more dependent on health facilities than a child health package (Maine, 2007; Rosato et al., 2008). However, several interventions could potentially be provided, such as family planning or nutritional supplements for women (Costello, Azad and Barnett, 2006; Rosato et al., 2008). In a systematic review of interventions to address maternal, newborn and child survival, Bhutta et al. (2008) suggested campaigns could go further still. They identified "health days" promoted through mass media as one of 37 key interventions and delivery strategies with potential, marking them as especially suited to the promotion of reproductive health and family planning, and for the promotion of appropriate care seeking and antenatal care during pregnancy. The idea is that in places where the health system is inadequate, campaigns – in the form of health days or expanded to health weeks – could be used as a health services delivery platform for multiple interventions, not just for children, but also for their mothers and pregnant women. An interim review of progress on the Millennium Development Goals also reported "coverage of

interventions delivered directly in the community on scheduled occasions was higher than for interventions relying on functional health systems" (Bhutta et al., 2010).

The expansion of services via campaigns provided in "health weeks" is not a community approach, or an attempt to provide comprehensive primary health care. Campaigns address urgent health needs of the most needy, and not coincidentally, may allow countries to meet MDGs.

III. Integration?

Recent work has tried to refuse a dichotomy between the "vertical" mass campaigns and "horizontal" routine health system interventions, arguing for a "diagnonal approach" to gradually strengthen the health system (Sepúlveda, 2006; Ooms, 2008). Mass campaigns could be an opportunity, some qualitative research has found, for developing human resource training, developing management skills and stimulated intersectoral collaborations, especially in the case where complex planning of multiple child health-related interventions are delivered (Hanvarongchai et al., 2011). Diagonalization is in fact a return to a classic WHO framing of public health by Gonzalez (1965), updated to incorporate the basic components of selective primary health care. Gonzalez wrote that there were:

> two apparently conflicting approaches to which countries should give careful consideration in their efforts to provide health care for the population. The first, generally known as the "horizontal approach", seeks to tackle the over-all health problems on a wide front and on a long-term basis through the creation of a system of permanent institutions commonly known as "general health services". The second, or "vertical approach", calls for the solution of a given health problem through the application of specific measures by means of single-purpose machinery. For the latter type of programme the term "mass campaign" has become widely accepted.

The two approaches were understood already when Gonzalez was writing as complementary. General health services were comprehensive, ("non-categorical"), permanent, embedded in community life, and could flexibly adjust to changing disease patterns. Mass campaigns, on the other hand, could deal with immediate scourges that were impeding the social and economic development of a country (Gonzalez, 1965). Ideally, both should be coordinated and combined with the long-term goal of unified "general health services."

Yet, in the crucial phase of expansion and implementation of a unified strategy, global efforts turned toward away from a relatively balanced approach and focused narrowly on the package of low-cost technical interventions. Selective Primary Health Care had been proposed "in an age of diminishing resources" as a way to improve "the health and well-being of those 'trapped at the bottom of the scale' … before the year 2000" (Walsh and Warren, 1979).[3] In this, the Millennium Development Goals change little but the year of reckoning. SPHC, more specifically however, suggested the administration of antimalarial drugs for children and what became known as GOBI: growth monitoring, oral rehydration techniques, breast-feeding, and immunization. For many years the original inclusion of antimalarials was ignored; in more dire public health situations, only immunizations remained.

[3] For an excellent review and analysis of how and why this happened, see Cueto, Marcos. 2004. The Origins of Primary Health Care and Selective Primary Health Care. American Journal of Public Health 94 (11):1864-1874.

Selective primary health care was premised on the argument that the best way to improve the health of the most people, at the time, was to fight disease based on cost-effective medical interventions, with four factors to guide the selection of target diseases for prevention and treatment: prevalence; morbidity; mortality; and feasibility of control (including efficacy and cost). The diagonal approach, most prominently in Mexico, attempts to bring back the core proposals of SPHC and add additional ones. Mexico implemented a policy that took single poliomyelitis vaccination days in 1985 and developed them into National Health Weeks by 1993, bridging homes and clinics with a basic package of health services (Sepúlveda et al., 2006). The goal is to produce long-term health system strengthening by, for example, increasing human capacity to provide clinical care, either through training new people, or by using funding to redirect efforts, tied up in tertiary care for the privileged, to marginalized populations.

IV. Elements of Research Design

The Millennium Development Goals elevate specific imperatives out of general need. To meet MDG4 and MDG5, countries have to choose child and maternal health interventions, and further, decide which type of health system delivery to use. At this critical interface of competing approaches in resource-scarce settings, the capacity to produce specific knowledge about interventions and which platforms can most effectively deliver them is needed in a timely and readily adaptable manner. One way this will come down to the ground level is in choosing to put resources (financial and human) toward integrated mass campaigns or routine services. We recognize the goal of health as a good; the task is to develop adequate equipment (Stalcup and Verguet, 2011). We propose five elements that should be included in research models that will aid in comparing this trade-off. The evidence base developed through such evaluations will not reveal the "right" answer, but will allow decision-making with a clear eye to the value judgments involved.

We focus on projects that would assess the technical and operational feasibility, equity, and cost-effectiveness of various integrated delivery platforms for maternal and child health in low- and middle-income countries. Such platforms could address the health needs of mothers and children and provide a first step toward using the campaigns to strengthen the health system, as proposed in the "diagonal approach." Research, we suggest, should focus first at the regional and sub-regional level so that what effect resource allocation will have can be adequately evaluated, thus guiding decisions about prioritization. Research needs to be designed to draw on local knowledge of conditions, as well as academic expertise in diverse disciplines: medicine, medical anthropology, health economics, operations research, public health and public policy. As such, it has the potential to strengthen ties between health recipients and providers on the ground, and researchers, a step that would move us closer to both better research and better health care.

In the following, we provide an index of five factors of research in maternal and child health. These, we suggest, should be included in research design in order to produce data necessary to identifying which maternal and child health interventions are most needed in the region, and if they would be better delivered during campaigns, or routinely. The aim for any given social-territorial grouping (village, surrounding community, region, nation etc.) to be able to precisely evaluate allocating resources to 1) maternal and child health routine services versus 2) maternal and child health mass campaigns. Additionally, the benefits and opportunities of expanding the interventions delivered on either health delivery platform could be substantial if designed to address the needs of specific populations. For example, since the reach of health

services in many sub-Saharan African countries is poor, a campaign delivery platform, diversified to reach adolescent and adult pregnant women, mothers, as well as children, has potential to increase reach to the underserved and improve equity. At the same time, researchers should be aware that incremental gains from campaigns may also provide reasons or excuses for not strengthening the health system to provide adequate routine services.

Evaluation is part of the process of figuring out the best combination of health delivery platforms at any given geographic level. In that sense, one needs to assess the opportunities and challenges of delivering interventions via the routine platform or the campaign platform, or a combination of the two platforms as precisely as possible. We propose five factors that should guide the selection of interventions, and correspondingly, platforms:

- country health system operational feasibility
- impact on mortality and morbidity
- distributional consequences and equity
- implementation costs
- impact on health systems

First, assessing the operational feasibility of implementing one delivery platform as opposed to the other or both is necessary, as there will be specific human and logistical constraints. Second, prevalence of mortality and morbidity in the country for children, adolescents and mothers, and how the underlying burden of disease can be further reduced by the implementation of one delivery platform as opposed to the other or both, must be estimated. Third is a measurement of the distributional consequences of the implementation of one platform as opposed to the other, or both, i.e. the determination of whom benefits from the implementation of a platform, depending on the wealth and geographical location of the populations, for the different maternal and child health interventions. Fourth is the implementation costs of the different maternal and child health delivery platforms. Fifth is the impact on health systems of the implementation of the platforms, notably the drag on human resources from accomplishing routine duties if periodically called to work on a mass campaign.

We emphasize the need to leverage qualitative research to capture the complexity inherent to public health (Williamson et al., 2009), including specificities of the situation at different levels (Baum, 1995): the health needs of populations in regions with mosquitoes or without, for example; what interventions are feasible in a region given its infrastructure; which interventions are wanted and will be used by the population; and the dynamics and interactions between various players, such as chains of authority and responsibility, that are relevant to the implementation of maternal and child health interventions. Each analysis done in this way, if shared, could contribute to the development of a body of data that health policy decision makers could use in a range of low- to middle-income country settings, with the goal of enabling these countries to use such research to guide maternal and child health and ultimately population-wide health service delivery.

Country health system operational feasibility

Researchers should consult local stakeholders where the analysis will be conducted. It is important to have substantial engagement with technical groups, but also with people who have implemented campaigns on the ground and/or are routine health care providers in the region.

Potential partners can include representatives from a Medical Research Council, a National Department of Health, Provincial Departments of Health, WHO and UNICEF, etc.

Stakeholders will have key information on ways to maximize maternal and child health delivery platforms, and on pitfalls from previous efforts. Questions should aim for a qualitative description of the technical criteria relevant to delivery of interventions through a common platform, aiming to identify what is not considered in standard analyses.

The information collected can be analyzed to assess the technical feasibility of integrating several combinations of maternal and child health interventions onto routine / campaign delivery platforms at the country level. The results will have implications for decision makers in terms of how to optimize each delivery platform for better health outcomes and lower costs. From this, they can decide upon the distribution of the benefits in the population, and compare the two delivery platforms against each other in order to choose what to implement and how.

Impact on mortality and morbidity

The effectiveness of vaccination programs and maternal care is strongly influenced by which prevention/treatment interventions are included, and stakeholders should have input into that decision. Examples of interventions are those on the list of the Child Health Days platform in sub-Saharan Africa (WHO, 2009b): vitamin A supplementation, insecticide-treated bed nets, measles, and OPV vaccination, for children. Possible additions are iron supplements, contraceptives, and HIV testing for mothers; and antihelminthics for children and mothers. The health benefits will depend on thoughtful implementation of the routine or campaign platform in the target country.

Distributional consequences

Looking only at the effectiveness of a delivery platform on the burden of disease is insufficient. Analysis must also consider equity, looking at the distribution in the population of those targeted by the routine or campaign delivery platform. While campaigns are not regularly implemented, they have the advantage of targeting populations which are not commonly reached by health systems' routine services. This is one of the underlying motivation of measles SIAs (Heymann et al., 2010; Christie et al., 2011).

Implementation costs

The cost of providing interventions will vary regionally, and accordingly, research should be designed to calculate costs, for implementing the routine and campaign platforms, or a combination of both, at at least the regional level. Subsequently, these can be compared. The general categories of cost include but are not limited to: medical supplies, biohazard waste disposal, human resources (clinical staff, administration including data collection and processing) transportation, and infrastructure (whether temporary or permanent).

Impact on health systems

There is a twofold need for research on the health system impact of different platforms: first, the concept of health systems strengthening is vague, and second, the evidence base for informing policies and programs for strengthening health systems is weak (Hafner and Shiffman, 2012). The campaign platform puts a special emphasis on underserved populations, in that one of the objectives of mass campaigns is to target populations that are not often reached by the health system. Yet such campaigns can negatively impact routine health services. For example, these

campaigns can detract health personnel from accomplishing routine duties (Hanvarongchai et al., 2011). Several studies have shown that implementation of the polio and measles campaigns can be associated with a decrease in routine vaccine coverage (Dietz et al., 1997; Taylor et al., 1997; Aylward et al., 1997; Bonu et al., 2004; Schreuder et al., 2001).

V. Considerations

There are many other aspects of the Millennium Development Goals that deserve discussion (cf Darrow, 2012).[4] Defining success on global and national levels masks where failure occurs locally, and there are large within-country inequalities (Vandemoortele, 2011: 15). Having goals in the first place means that some things were excluded (notably, social security or social protection (Darrow, 2012: 5)). The pressure to meet targets means that effort must be made to collect data on those targets, which is effort not put toward actually meeting them (providing heath care, for example), and can provide incentive to people on the ground or in positions of authority in government to pad the numbers.

A combination of strategies will be used to meet crucial basic health needs targeted in the MDGs. The proposed design aims to support the identification of when it makes sense to invest in expanded routine services or mass campaigns, and when this very provision strengthens or weakens the overall health system. At this juncture lies the development of feasible, cost-effective and equitable delivery of maternal and child health care in countries with low incomes, or extremely disparate wealth distribution. "Only society can choose," wrote the advocate of comprehensive primary health care we cited at the beginning of this article, "and if a society has rights one of them must be the right to know what the choices are, to have access to those choices in an acceptable way, and to understand the consequences or implications of the decisions" (Newell, 1988).

We envision two paths forward from this stage. First, we hope that a combination of qualitative and quantitative methodology can be adapted to comparative assessments within a country that shows regional variation, as well as between different countries. Second, we hope that such work could provide the basis for evaluation of integrated delivery platforms for maternal and child health which could optimize vertical and horizontal approaches, thus reducing the sacrifice of more comprehensive primary care because mass campaigns address more immediate inequities and health imperatives. Finally, we point to the limits of evidence in evidence-based policy making (Segone and Pron, 2008). Metrics and evalation have political and ethical ramifications, which should be lifted out and examined rather than being left tacit. Laying out the specific advantages and disadvantages of different combinations of interventions on different platforms makes the challenges of equity available for discussion, but does not overcome them. No model for designing research on the provision of health can answer the ethical questions inherent to a world with inequality, yet those questions can at least be made an integral part of research, as a step toward finding answers.

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[4] Darrow suggests that for the post-2015 development agenda, the following problems are particularly deserving of attention: "tensions between MDG progress and authoritarian governance; procedural and legitimacy concerns; problems relating to poor specification; inappropriate scale of ambition based upon unreliable and arbitrary assumptions about feasibility; misinterpretation and misapplication of the MDGs at the national level; the failure to address growing inequalities; tensions with international human rights legal standards; and colonisation of the MDGs by economic growth and aid lobbies."

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