B | Global Economy
and Development
at BROOKINGS

# CHANGE OF PACE

## ACCELERATIONS AND ADVANCES DURING THE MILLENNIUM DEVELOPMENT GOAL ERA

**EXECUTIVE SUMMARY**

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# EXECUTIVE SUMMARY

**D**id the Millennium Development Goals (MDGs) make any difference? Perhaps no question is more important for assessing the results of global policy cooperation over the past 15 years. But this is a challenging question to answer empirically. Amid the world's complex cross-currents of economics, politics and security, pathways of cause and effect are difficult to discern. Moreover, the MDGs spoke to a wide range of policy priorities, so any findings are likely to vary considerably across issues and geographies.

Nonetheless, it is possible to conduct a quantitative investigation of trends before and after the establishment of the MDGs: Which trajectories changed where, and to what scale of human consequence? That is the main purpose of this paper. It aims to answer the "what" questions in a manner that establishes boundaries for subsequent debate about "why" some patterns shifted while others did not.

Among skeptics, there are three common critiques of the MDGs. One is that all progress was on course to happen anyway. According to this view, the MDGs were little more than a "bureaucratic accounting exercise with scant impact on reality," according, for example, to a Financial Times editorial in September 2015. A second is that global development aggregates are driven by China and India, two very large developing countries whose progress is considered independent to multilateral system efforts. A third is that progress on development outcomes is simply a product of underlying economic growth, rather than directed policy efforts.

This paper informs an assessment of whether the first two of these critiques are correct, and thereby provides reference points to inform future investigations of the third. To our knowledge, this is the first cross-sectoral analysis of MDG-relevant trends since the conclusion of the 2015 deadline. The results provide a reference point for efforts toward the newly established Sustainable Development Goals (SDGs) for 2030.

For each indicator, our guiding logic contrasts the amount of progress with the rate of acceleration, recognizing that different populations faced different starting situations as of the early 2000s. Countries that were experiencing slow rates of progress during the 1990s were best served if they could achieve rapid acceleration and large overall gains during the 2000s. But acceleration is a less appropriate test for countries that were already experiencing fast progress during the 1990s and merely continued their fast pace of gains to achieve significant cumulative results. In some cases it is possible that simply maintaining a rate of progress amounted to a policy victory, if factors were otherwise pushing toward a slowdown.

We structure the analysis around four substantive categories of variables: life and death issues, including child mortality, maternal mortality, HIV/AIDS, tuberculosis, and malaria; basic needs, including water, sanitation, (under)nourishment, primary education completion, and gender parity in enrollment; extreme income poverty, measured as the head-count poverty ratio; and natural capital, for which measures of forest cover and protected land area served as proxies.

One of the paper's main contributions is to apply a consistent logic across indicators while aiming to avoid analytical errors that would result from a simplistic one-size-fits-all methodology. Our core approach is straightforward. We calculate rates of progress from the pre-MDG period to establish "business-as-usual" (BAU) trajectories for each variable of interest, and then compare these with rates of progress following the establishment of the MDGs. Three quantitative assessments are

applied across indicators: simple counts of how many countries accelerated; statistical t-tests for difference in mean rates of annual progress; and bottom-up calculations of the number of incremental lives saved or improved (or not) due to accelerations (or decelerations) in progress. We apply the tests separately to countries by regional grouping and initial income classification.

We tweak methods where appropriate, based on the substantive nature of each issue and the availability of historical data. For example, we do not test for accelerations in progress on malaria deaths among countries that did not have a significant malaria problem as of 2000. Similarly, we exclude countries from tests for acceleration on access to drinking water if they already recorded universal access as of the launch of the MDGs. The composition of each indicator's pre-MDG reference period depends on data availability. At one end of the spectrum, child mortality and maternal mortality have extensive time series that permit consideration of a range of pre-MDG reference periods. At the other end of the spectrum, country-level data for antiretroviral therapy for HIV/AIDS are not reliably available for the 1990s so we calculate trends from 2000 to 2002 as an approximate pre-MDG baseline. All results are presented with the strong caveat that data quality remains highly variable across indicators.

## Findings

Our results show that much of the world's post-2000 accelerations in progress occurred in low-income countries (LICs) and in sub-Saharan Africa (hereafter Africa). Meanwhile, middle-income countries (MICs) and the rest of the world, outside of China and India, typically registered larger gains but less acceleration. Life and death issues had the most substantial overall advances in the poorest countries. Among basic needs indicators, the story is more mixed. Improvements in

primary school completion rates markedly accelerated in much of the developing world. On undernourishment, countries saw an average acceleration in progress, although not in many of the most populous countries. Water and sanitation both experienced a general continuation of business-as-usual trends. Gender parity in education made considerable progress in many countries, although data gaps inhibit robust comparisons across countries and over time. Environmental indicators such as area under forest cover saw limited gains and, in much of the world, retrogression.

The trends are partly captured in Table E.1, which presents t-test results for statistically significant differences in average country rates of progress before and after the launch of MDGs. The table conveys—for each region and initial income group—the extent to which a typical country in each group experienced an acceleration in progress compared with the pertinent pre-MDG reference period. Blue boxes indicate a faster average annual rate of progress post-2000 and orange boxes indicate a slower rate. A positive (+) or negative (-) symbol signifies a sizeable shift, defined as at least a 1 percentage point change in annual proportional progress for child and maternal mortality, or a 0.33 percentage point change in annual absolute rates of progress for other indicators. Empty cells reflect no statistically significant average change in rates of progress.

The results show that both LICs and African countries had positive acceleration on most indicators. The results for child mortality are particularly striking: Both LICs and African country subgroups experienced an average jump of more than 2 percentage points per year in their rates of progress, compared with the 1990s. Meanwhile, Latin America and the Caribbean sustained a slowdown on child mortality gains, and also on access to water and access to sanitation, albeit from much better starting points as of 2000.

## Table E.1. Changes in average country rates of progress, 1990-2000 versus 2000-2015

| | | | By Income Group | | By Geography | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | All Developing | Low-income | Middle-income | East Asia & Pacific | Europe & Central Asia | Latin America & Caribbean | Middle East & North Africa | South Asia | Sub-Saharan Africa |
| **Life and Death** | Child mortality | + | + | | | + | (orange) | | | + |
| | Maternal mortality | | + | | | | | – | | + |
| **Basic Needs** | AIDS treatment | + | + | + | + | + | + | | + | + |
| | Improved water | | (blue) | (orange) | | (blue) | (orange) | | | |
| | Improved sanitation | | (blue) | (orange) | | | (orange) | | | (blue) |
| | Undernourishment | + | + | (blue) | | | | | | + |
| | Primary school completion | + | + | | (blue) | | | | | + |
| | Gender parity index, primary | + | | | | | | | | |
| **Income poverty** | Head-count rate | + | | + | | + | | | | |
| **Natural Capital** | Forest area | | | | | | | | | |
| | Protected land area | | | | (orange) | | | | | (blue) |

■ faster progress ■ slower progress ■ limited data coverage **+/−** major change in rate

*Notes:* (1) Shaded boxes indicate statistically significant difference (p<0.05) of mean annual rates, pre- versus post-MDG adoption. The "+" and "−" symbols indicate a large change in rates, defined as >1 percentage point change in annual proportional progress for child and maternal mortality, or >0.33 percentage point change for annual absolute progress for other indicators. (2) AIDS treatment coverage compares rates of progress from 2000-2002 versus 2002-2015. (3) Extreme income poverty results based on very limited available data: 11 low-income countries and 25 middle-income countries.

*Sources:* Authors' calculations based on UN-IGME(2015), World Bank (2016c).

More generally, the developing world was already making steady aggregate gains on some issues, such as hunger and access to drinking water, prior to the establishment of the MDGs, and many trends tended to continue at a similar pace post-2000. LICs did register a statistically significant average acceleration on both water and on sanitation, but the difference was 0.1 percentage points per year, which adds up to a 1.5 percentage point difference from BAU trajectories after 15 years.

Results for extreme income poverty in Table E.1 are presented in lightly shaded boxes to signify the limited data availability. Only 36 countries have adequate time series to compare pre- and post-MDG rates of progress. This includes 25 MICs, which recorded average acceleration on poverty headcounts of 0.62 percentage points per year, and 11 LICs, which recorded somewhat greater but not statistically significant acceleration.

Among the issues analyzed, the clearest shortcomings during the MDG era, which we generally benchmark as the period from 2000 to 2015, were in the realm of natural capital and environmental sustainability. At the global level, the 2010 target for reversing biodiversity loss was not achieved. Less than half the countries improved their rate of progress in protected land area and only 37 of 150 countries recorded slight accelerations in expanding area under forest cover, but the differences were mostly small. On the whole, developing countries lost more than 700,000 square kilometers of forest cover between 2000 and 2015.

## Human consequences of progress

Changes in country-level trajectories can be aggregated up to calculate rough estimates of the resulting numbers of incremental lives saved and improved. Figure E.1 synthesizes the relevant findings. The foremost result is that an estimated range of 21.0 million to 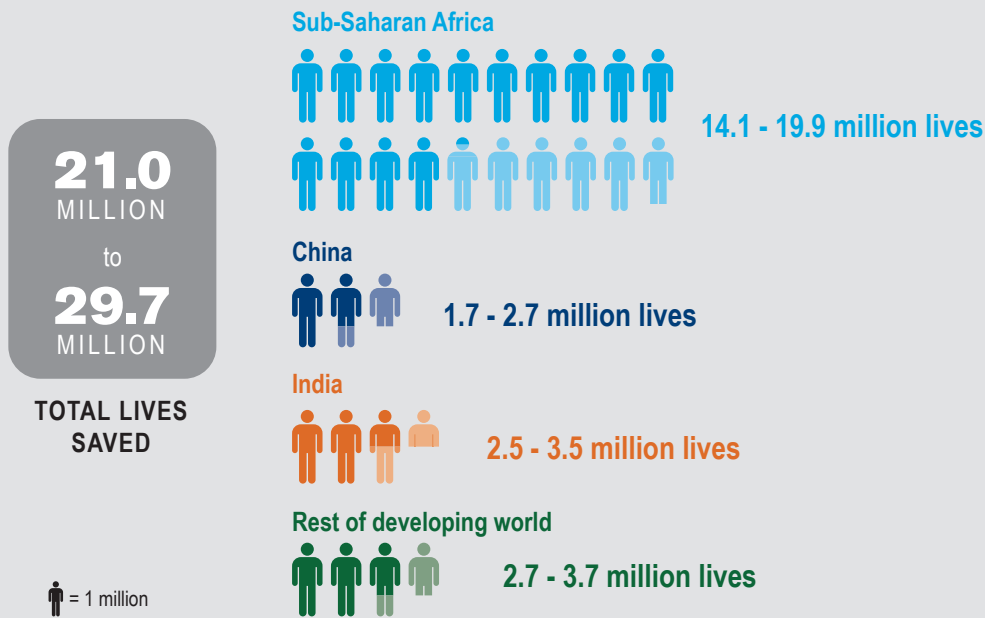29.7 million additional lives were saved during the MDG era, compared with pre-MDG trajectories. Ranges are based on whether one considers 1990-2000 or 1996-2001 as the relevant pre-MDG trend period for child mortality and maternal mortality. The figure shows that Africa was responsible for roughly two-thirds of the overall figure, at least 14.1 million lives. China and India were together responsible for only approximately one fifth of the total.

Most of the overall lives saved are due to accelerated progress in child mortality, responsible for an estimated 8.8 million to 17.3 million lives saved, plus breakthroughs in treatment for HIV/AIDS, responsible for another 8.7 million lives. Reductions in tuberculosis deaths account for an estimated 3.1 million deaths averted and faster progress on maternal mortality led to another 0.4 million to 0.6 million lives saved.

Figure E.2 presents similar calculations for lives improved on various basic needs, indicating the breakdown between China, India, sub-Saharan Africa, and the rest of the developing world. The results for drinking water, sanitation, and undernourishment are less sanguine. Although a large number of countries experienced accelerated gains, as indicated above, many populous countries experienced deceleration, resulting in aggregate estimates of incremental lives affected that are either negative or so small as to be indistinguishable from zero in practical terms. An estimated 99 million fewer people have water today than would have been the case if 1990s trends had continued, and 169 million fewer people would have been undernourished. For sanitation, China, India and sub-Saharan African countries each recorded modest incremental gains while the rest of the developing world went through an aggregate slowdown.
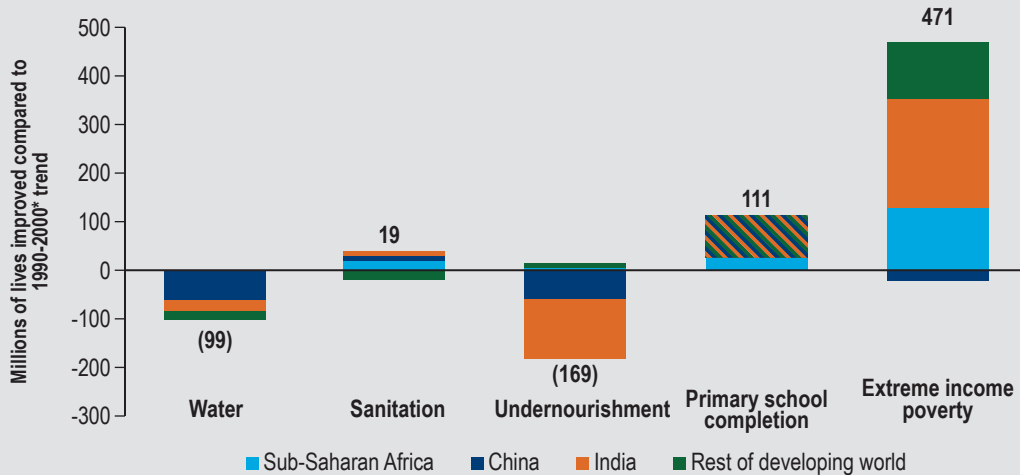
Primary school completion rates have much more positive results. An estimated 111 million more people had

Figure E.1: Total lives saved between 2000/2001 and 2015 due to accelerated progress

**21.0** MILLION
to
**29.7** MILLION

**TOTAL LIVES SAVED**

👤 = 1 million

**Sub-Saharan Africa**
14.1 - 19.9 million lives

**China**
1.7 - 2.7 million lives

**India**
2.5 - 3.5 million lives

**Rest of developing world**
2.7 - 3.7 million lives

*Sources:* Authors' calculations based on UN-IGME (2015), World Bank (2016c), WHO (2016b), UNAIDS (2016b, c).



Figure E.2: Millions of lives improved as of 2015 - or not - due to accelerated progress since 2000*

Millions of lives improved compared to 1990-2000* trend

| | Water | Sanitation | Undernourishment | Primary school completion | Extreme income poverty |
|---|---|---|---|---|---|
| | (99) | 19 | (169) | 111 | 471 |

■ Sub-Saharan Africa  ■ China  ■ India  ■ Rest of developing world

*Notes:* For primary school completion, data do not allow for regional breakdown outside of Africa. * Years adjusted to account for data availability where needed.
*Sources:* Authors' calculations based on World Bank (2016b, c), U.N.-DESA (2015).

completed primary school as of 2015, compared with 1990-2000 trajectories. Around a quarter of the gains were in Africa; data gaps prevent a precise decomposition of how the other three quarters are spread among China, India and the rest of the world.

Extreme income poverty forms only a small part of our overall analysis, because head-count ratios suffer from weak country-level time-series data and rigorous counterfactuals would require complex assumptions regarding distributional patters of economic growth within countries. Nonetheless, we do assess very basic trajectories of head-count poverty and find that most regions experienced an acceleration in reductions over the period since 2002, as also shown in Figure E.2. The exception was East Asia and the Pacific, notably including China, which had a slight slowdown from its overall fast pace of decline during the 1990s. In total, an estimated 471 million fewer people were in extreme poverty as of 2013 than would have been the case under 1990-2002 trajectories. This includes 225 million people in India, 150 million in Africa, and 119 million in the rest of the world.

## Synthesis

Outcomes during the MDG period can be synthesized according to both total amount of progress and post-2000 acceleration in rates of progress. To that end, Figure E.3 synthesizes the results for LICs (excluding India) and MICs (excluding China), across the four variables where country-level data permit distillation by initial income group: child mortality, maternal mortality, drinking water, and sanitation. The horizontal axis indicates the aggregate share of each problem eliminated between 1990 and 2015, the general benchmarking horizon for most MDG targets. The vertical axis indicates the amount of post-2000 acceleration in population-weighted proportional rates of progress, compared with the 1990s. A ratio of 1 implies a constant rate of progress, while a ratio of 2 implies a doubling in the rate of progress, and so forth.

Recognizing the imperfect nature of the underlying data and hence results, Figure E.3 shows a clear pattern whereby LICs experienced greater acceleration than MICs on each indicator except access to water, while MICs achieved greater gains relative to their starting points. Figure E.4 shows results for Africa alone and



Figure E.3: Acceleration versus progress during the MDG era, by initial income group
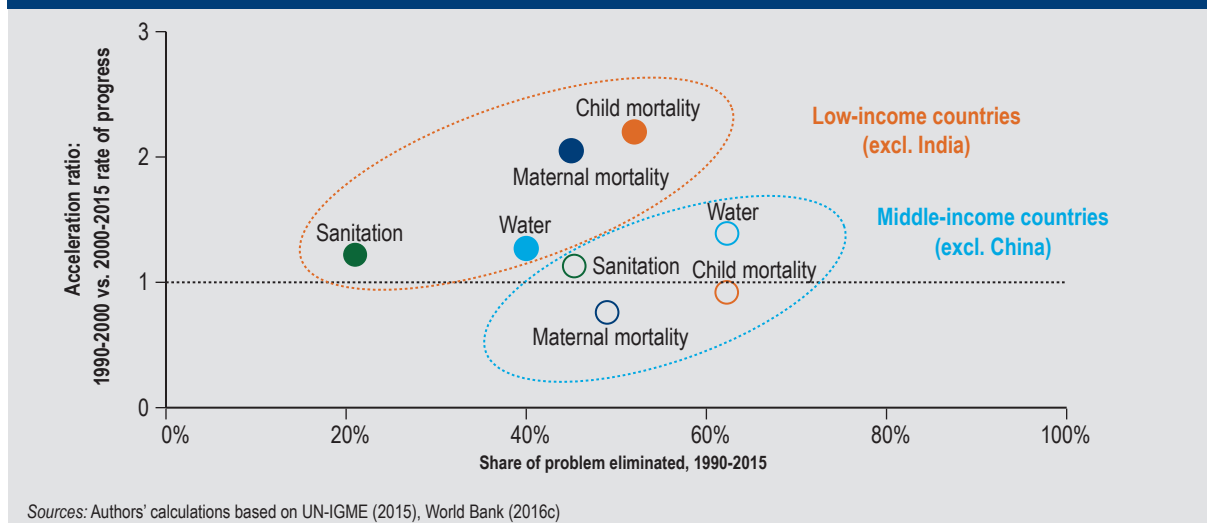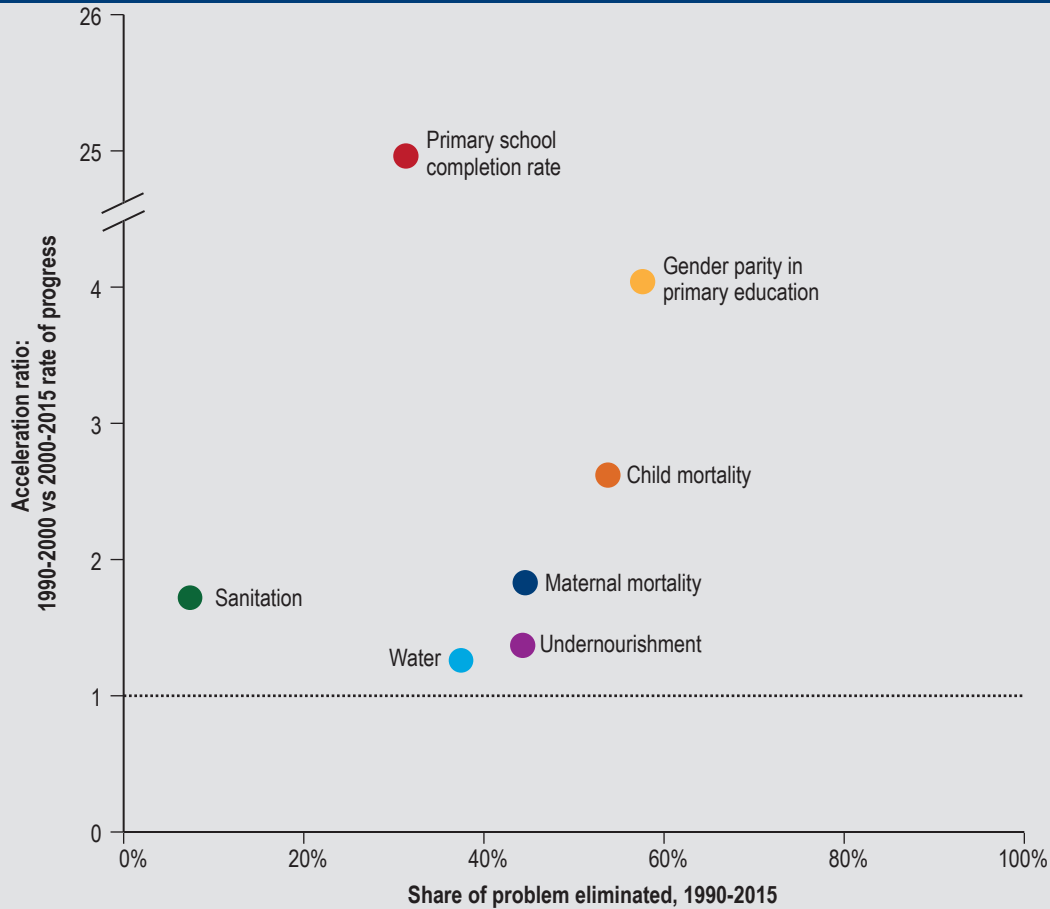
*Sources:* Authors' calculations based on UN-IGME (2015), World Bank (2016c)

Figure E.4: Sub-Saharan Africa – widespread acceleration

**Acceleration ratio: 1990-2000 vs 2000-2015 rate of progress** (vertical axis)

**Share of problem eliminated, 1990-2015** (horizontal axis)

Primary school completion rate

Gender parity in primary education

Child mortality

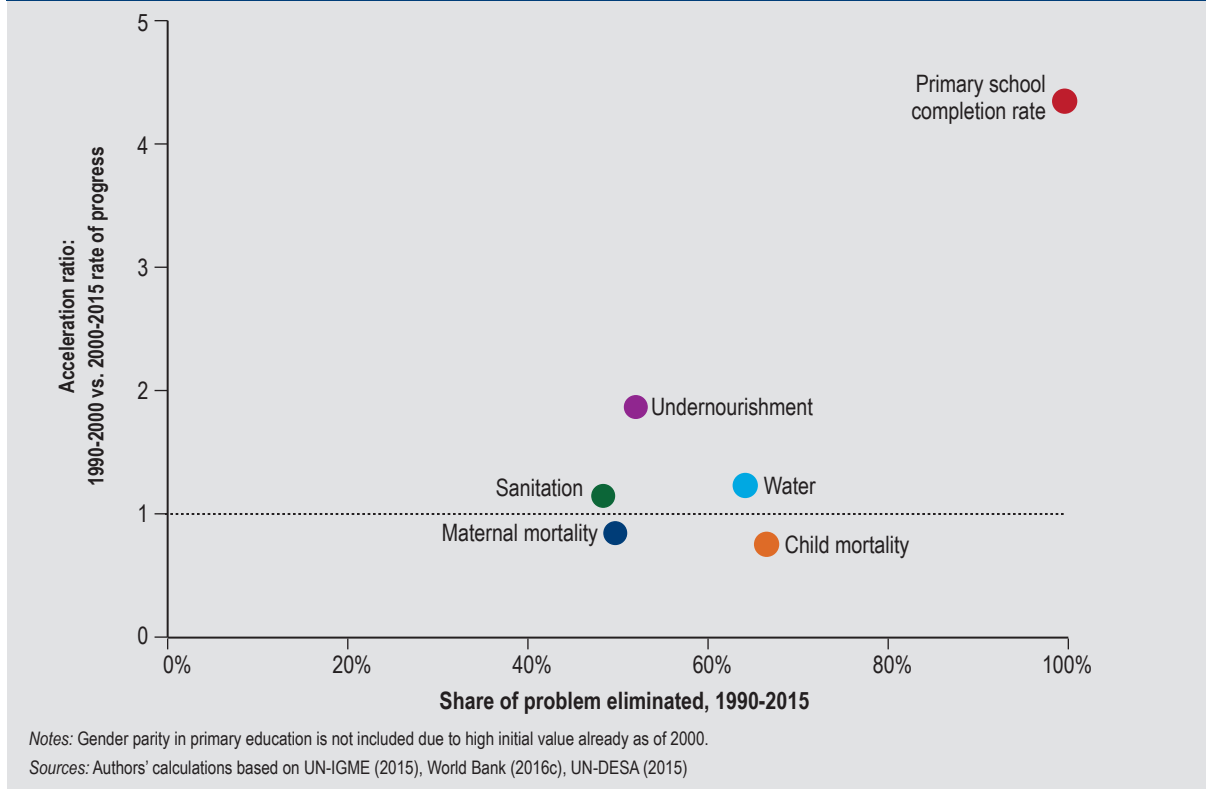Maternal mortality

Sanitation

Undernourishment

Water

*Sources:* Authors' calculations based on UN-IGME (2015), World Bank (2016c), UN-DESA (2015)

also includes region-specific calculations for under-nourishment, gender parity in primary education, and primary school completion. Progress in reducing child mortality again shows very positive results in Africa, although primary school completion is the indicator with the most significant acceleration in the region; the vertical axis is truncated to account for the dramatic shift, with a 25-fold improvement in the rate of progress, following near zero annual progress during the 1990s. More disconcertingly, only 7 percent of Africa's access to sanitation problem was addressed between 1990 and 2015, even as the rate of progress nearly doubled.

Patterns of progress differed considerably across regions. For example, Figure E.5 presents a synthesis for Latin America and the Caribbean. The graph shows many dots on the right half of the graph, indicating large relative gains, but most are vertically concentrated near the dotted line indicating no change in the rate of progress. The notable exceptions are undernourishment and primary school completion, which had accelerations in the proportional rate of progress as the respective problems got closer to elimination. Meanwhile, both child mortality and maternal mortality experienced modest slowdowns com-

## Figure E.5: Latin America and the Caribbean – major gains, less acceleration

**Acceleration ratio:**
**1990-2000 vs. 2000-2015 rate of progress**

- Primary school completion rate
- Undernourishment
- Water
- Sanitation
- Maternal mortality
- Child mortality

**Share of problem eliminated, 1990-2015**

*Notes:* Gender parity in primary education is not included due to high initial value already as of 2000.
*Sources:* Authors' calculations based on UN-IGME (2015), World Bank (2016c), UN-DESA (2015)

pared to the region's relatively high rates of progress during the 1990s.

## Implications

Our results highlight the 2015 outcomes that were not on track to happen as of 2000. They also show that China and India have not been the overwhelming drivers of acceleration, whereas African and low-income countries often have been, especially on matters of life and death.

The global variations in absolute amounts of progress and accelerations in rates of progress prompt questions as to what drove the differences, especially among low-income countries. If one presumes, for ex-

ample, that economic growth is the primary driver of outcomes, then one would need to substantiate how the same underlying patterns of growth led to such different trends across outcomes such as HIV/AIDS deaths, child mortality, primary school completion, and access to drinking water. Conversely, if one believes that official development assistance is a primary driver of particular outcomes in low-income environments, then one would need to substantiate the links between issue-specific outcomes and relevant forms of public and private finance.

The range of results across sectors also draws attention to the role of institutions and policy communities. The field of global health, for instance, underwent a major expansion of leading international public in-

stitutions, private philanthropy, and active scientific research during the MDG period, backed by major increases in public financing and bolstered by ongoing applied research debates in The Lancet and other prominent journals. At the same time, the evidence prompts questions regarding which institutions, if any, had corresponding responsibilities for outcomes in areas that achieved less acceleration in progress—such as undernourishment and sanitation.

Finally, the analysis draws attention to inherently complex notions of public responsibility. When the world sets goals such as the MDGs—or now the Sustainable Development Goals—who is responsible for each component that feeds in to progress, ranging from research to evaluation to advocacy to financing to policy design to implementation? Who should be congratulated when complex systems generate unprecedented outcomes? Who should be accountable when populations fall short? Who should be held responsible for the adequacy of data even to assess progress?

This study's results help to inform assessments of how and where the world's patterns of progress changed pace during the MDG era. Some of the shifts were dramatic. Learning from them is crucial for generating the world's next batch of needed breakthroughs.