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Patterns of progress on the MDGs and implications for target setting post-2015

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
EAP	East Asia and the Pacific
ECA	Europe and Central Asia
GPI	Gender Parity Index
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
LAC	Latin America and the Caribbean
MDG	Millennium Development Goals
MENA	Middle East and North Africa
ODI	Overseas Development Institute
PPP	Purchasing Power Parity
SSA	Sub-Saharan Africa
UN	United Nations
UNDP	UN Development Programme
UNICEF	UN Children's Fund
WDI	World Development Indicators
WHO	World Health Organization

Abstract

The Millennium Development Goals (MDGs) have become a key metric for measuring the performance of developing countries in addressing critical development challenges. The goals are expressed in concrete, time-bound targets set in either in relative terms – for example reducing relative poverty by half – or in terms of 'getting to zero' – for example achieving universal primary education. While originally framed as global targets, the MDGs have been widely applied as national targets to benchmark progress.

This country-level application has been problematic in some cases, however, and promoted a misperception of real progress made. This is because applying the same targets to all countries suggests similar efforts will result in similar 'gains' across different countries. But our analysis – alongside that of others – shows progress is rarely linear: improvements in people's lives across different dimensions occur at varying rates across countries. For some MDG targets, progress has been faster for countries further from a target; for others it has been slower.

To examine the true patterns of progress on the MDGs, this paper explores seven indicators – one representing each of the first seven MDGs. For all indicators but extreme poverty, we find that typically, progress is easiest to attain for countries that are relatively deprived (or further from the target), though there are important differences between indicators. Progress is notably non-linear for educational enrolment, maternal mortality and HIV/AIDS – areas where there is most reliance on government services. Stipulation of similar rates of progress or absolute goalposts means these non-linearities are overlooked, and targets are framed in an overly ambitious way for many countries.

In most assessments of MDG progress by major international institutions, countries are classified as either 'on track' or 'off track' by comparing required rates of progress to meet the MDG target with a country's actual performance. While recognising data gaps, we show that up to 46% of countries – depending on the indicator – have registered better-than-expected progress on a number of MDG targets even though they may not be 'on track' to meet them.

How can targets be set in a non-linear world with countries at different stages of development? Setting targets using methods that recognise non-linearities in progress and initial starting points could help close the gap between normative goals and national realities. A global goal to 'get to zero' on maternal mortality, for example, could be calibrated to the speed of progress that might be expected given a country's initial level. To mobilise efforts and encourage action, it is important to set challenging but attainable MDG targets. This paper argues that there is a need to find a middle ground: to maintain the power of a unified set of goals while bringing in greater sensitivity to national realities. This focus would help bridge the gap between expectations and achievements.

Key messages

- Improvements across different MDG dimensions are often non-linear: they occur at varying rates at different times in different countries. On many MDG targets, countries' starting positions strongly condition progress.
- When applied at country level, MDG targets require overly ambitious performance for many countries because they stipulate similar rates of progress or the need to reach absolute goalposts.
- Many poor countries – up to 46%, depending on the indicator – have registered better-than-expected progress on some MDG targets, even though they are not 'on track' to meet them.
- In a post-2015 agreement, to provide more appropriate incentives for individual countries to 'leave no one behind', setting targets in a technical way could help bridge the gap between normative commitment and greater sensitivity to national realities.

1. Introduction

The Millennium Development Goals (MDGs) represent a global consensus on and a commitment to addressing critical development challenges including poverty reduction and improved livelihoods for the world's poor. The MDG targets have become a key metric for measuring the performance of developing countries. The original targets were derived mainly from existing UN targets agreed at previous sectoral conferences using linear extrapolations of past global trends (DAC, 1996; Manning, 2009; Vandemoortele, 2009).[1] Using a 1990 baseline and a 2015 deadline, they are expressed in either (i) relative terms, for example reducing income poverty by half, or (ii) in terms of eliminating shortfalls or 'getting to zero', for example achieving universal primary education.

Applying the same targets at the national level suggests all countries are equally capable of achieving equivalent rates of change, or in other words similar amounts of effort will result in similar 'gains' in progress across countries. In this way, an assumption of linear progress has been built in since the start. But progress is rarely linear, and such comparisons can give rise to pessimism about the prospects of certain countries and regions when they do not take into account the particular circumstances. Indeed, a notable feature of the MDG campaign is that it has emphasised the failure of sub-Saharan Africa (SSA) compared with other regions, not least in the widely reported finding around the mid-2000s that the region was the only one that was not 'on track' to meet any of the goals (Easterly, 2009). The finding that some countries are progressing more or less quickly than others does not necessarily imply a more successful strategy; it may simply reflect different starting points. Therefore, it is more accurate to evaluate progress relative to an expected trajectory based on past performance. Our analysis examines the implications of this for measuring progress towards the current MDGs, and for setting future targets for a post-2015 agreement.

This paper offers a systematic analysis of country performance on seven MDG indicators, one for each of the first seven goals. It argues that analysing progress using a more flexible method that accounts for country starting points and non-linear progress paths enables a better assessment of country performance than conventional methods (Box 1). The divergence of this method from conventional assessments gives rise to a discussion on how to reconcile country specificity with the value of a small, coherent set of global targets, a challenge highlighted in the recent report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda (2013). We suggest that the evidence as to how progress has occurred since 1990 supports a middle ground of setting so-called aspirational goals (see Fukuda-Parr et al., 2013) alongside country- or group-specific targets.

Section 2 discusses how progress towards the MDGs is usually measured and presents evidence of non-linearity in MDG progress. Section 3 explains our methodology and dataset. Section 4 presents results relating to each of the first seven MDGs. Section 5 discusses implications for target setting in a post-2015 framework. Section 6 concludes.

1 Education (Jomtien 1990); Children (New York 1990); Environment (Rio de Janeiro 1992); Human Rights (Vienna 1993); Population (Cairo 1994); Social Development (Copenhagen 1995); Women (Beijing 1995); Poverty (Copenhagen Declaration and Programme of Action 1995).

2. Measuring progress towards the MDGs

Library in rural Bangladesh. Photo: © Gates Foundation

We explore conventional ways of measuring progress towards the MDGs and some limitations before turning to the existing evidence on non-linear progress trajectories.

2.1 Conventional progress measures and their limitations

MDG progress is conventionally measured by computing the relative rate of change within a country or the reduction of a shortfall – depending on how the target is framed (Box 1).

Because they assume linear performance trajectories, both relative and shortfall measures can generate biases when evaluating country performance (Gidwitz et al., 2010). The bias will favour either more or less developed countries, depending on whether it is a relative or a shortfall target and whether an increase or reduction in the indicator is sought. For relative targets looking for a reduction (e.g. in poverty), more developed countries tend to be 'favoured' in that lower levels of absolute change translate into relatively higher rates of progress; where an increase is sought (e.g. in skilled birth attendants), the converse is true. For the shortfall reduction where an increase is sought, more developed countries with a smaller gap are 'favoured'; the converse also holds.

To report country progress on the basis of compliance with targets, the required rate of progress to meet each target is annualised and countries are classified as either 'on track' or 'off track' by comparing required rates of progress with actual performance. If the observed change is larger than that required to meet the MDG, the country is classified as 'on track'. For example, for Target 1.a – halving the proportion of people below the poverty line between 1990 and 2015 – a constant annual decline of

Box 1: MDG targets

Relative change

A relative measure of change identifies countries that have made the biggest improvement relative to their starting point.[i] It is calculated using the following general formula:

$$RC = [(X_{t1} - X_{t0})/X_{t0}] / (t_1 - t_0)$$

where X_{t0} and X_{t1} are the values of the indicator for the initial and the final year for which data are available, and $t_1 - t_0$ represents the time period.

The implication of a global relative target is that, on average, all countries would need to achieve the same relative change (e.g. a 50% reduction in the poverty headcount) regardless of their starting position. So, to halve poverty by 2015, a country like Guinea, with a 1990 income poverty rate of 93%, would need to reduce its poverty rate by 46.5 percentage points. A country like Mexico, with an initial rate of 4.8%, would need to reduce it by 2.4 percentage points.

Shortfall reduction rate

The shortfall reduction is the inverse of relative change: it measures the fall in the gap between a country's initial level and the indicator's limit. The reduction is calculated using the following formula:

$$SR = [-(X_{t1} - X_{t0})/(X_{max}-X_{t0})] / (t_1 - t_0)$$

where X_{max} indicates the final level.

The measure reflects national efforts to close development gaps (i.e. 'getting to zero'). Different efforts are needed at a country level, depending again on starting position. For example, a country starting from a 20% rate of access to clean water would need to increase it by 80 percentage points to reach a target of 100% coverage, whereas a country starting from 60% coverage would need an increase of 40 percentage points to reach the same target.

[i] The description of the 'relative change' and 'shortfall reduction' methods draws on UNDP (2005).

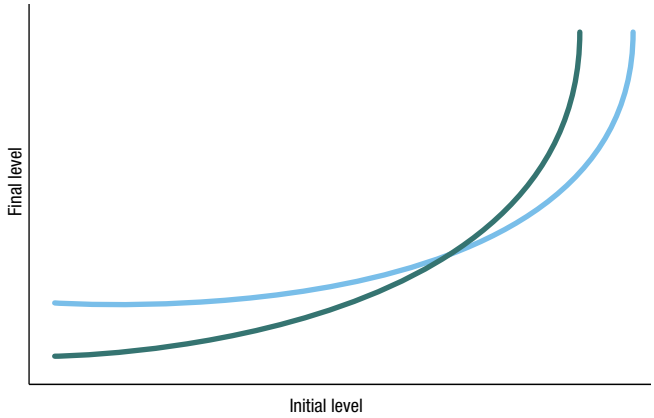
2%, or a compounded annual decline of 2.8%,[2] would be needed. If the observed change is larger than that required to meet the MDG, the county is classified as on track. The 'on-track/off-track' methodology assumes that it is feasible for all countries to achieve progress at a similar rate (relative change targets) or that those countries that lag behind can nonetheless bridge the gaps (shortfall reduction targets).

A deeper analysis finds that many poor countries, mainly countries in Africa, have registered remarkable progress on some MDG targets even though they may not meet them (Easterly, 2009); the targets contained within the MDGs are framed in ways that 'raise the bar' for very poor countries (ibid.). For example, among those 38 countries that had primary school enrolment rates below 80% in 2000, 'reaching even 95% enrolment by 2015 would require not simply atypical progress but progress with no precedent' (Clemens et al., 2007: 742). The way the global targets were devised – their focus on relative change and on 'getting to zero' – coupled with the way they became national targets is largely responsible for a mismatch between expectations and achievements.

Different methodologies used to assess performance lead to diverse perspectives on evaluating country performance. The Overseas Development Institute's (ODI's) Development Progress programme aims to measure change within and across dimensions of well-being by making the underlying parameters and assumptions for various measures more explicit. ODI's MDG Report Card (ODI, 2010) makes this point by simply comparing the different countries that emerge as top performers when using relative change and absolute change. Here, using a methodology that accounts for country starting points and the possibility of non-linear progress, we calculate a progress path that countries could be expected to follow for each MDG target. On the basis of a regression that predicts the final level of an indicator, taking into account initial levels, the 'deviation from fit' for each country is computed as the difference between each country's actual change and its 'expected

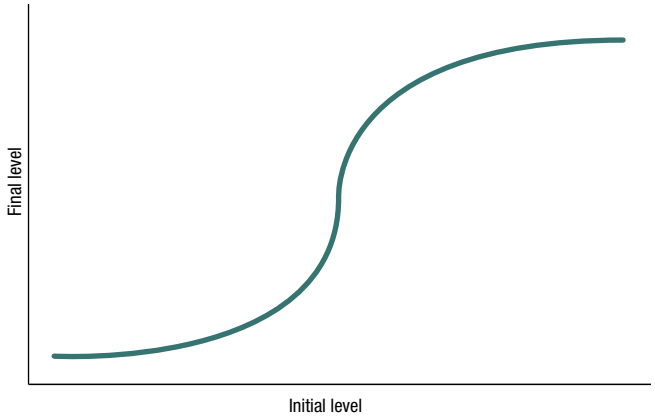
2 Although a compounded rate of change could be used to track progress and would imply a non-linear logarithmic function, the two most influential reports on global MDG progress use a linearised rate (see the UN Development Programme's Country Reporting Guidance (UN, 2012) and the World Bank's MDG Global Monitoring Report appendix (World Bank, 2011)). For simplicity, we also use a linearised rate. As the required compounded rate is higher than the linear rate, using the former would only intensify the differences between the required and the observed rates.

Figure 1a: Non-linear paths to MDG performance: Logarithmic function – rate of progress index under selected degrees of effort appreciation (ε)



Source: Hailu and Tsukada (2011).

Figure 1b: Non-linear paths to MDG performance: S-shaped function – ratio of male to female gross enrolment rate in secondary education



Source: Klasen and Lange (2012).

change' (following Gidwitz et al., 2010; UNDP, 2010). We use this method to assess country performance and to compare the results with the conventional 'on track'/'off track' methodology.

2.2 Non-linear progress trajectories

Past work has sought to identify the types of relationships (functional forms) that underlie paths of progress for a range of indicators over time, and affirms that rates of progress tend to vary at particular stages of development, rather than follow a linear path. These models make different assumptions about trajectories of progress. For example, Hailu and Tsukada (2011) use a logarithmic function to model progress on four MDG indicators, whereas Karver et al. (2012) alternate between logarithmic and quadratic models.[3]

A logarithmic transformation (Figure 1.a) recognises a change closer to the upper bound is harder to achieve than one in the lower part of the distribution. It formalises the intuitive notion of lower-hanging fruit being the easiest to reach. Quadratic models, in contrast, suggest a 'u-shape' – that progress is harder at the middle of the distribution, and much quicker for countries at both ends.

Klasen and Lange (2012) point to a consistent S-shaped transition path characterising progress in under-five mortality, primary school completion and gender parity in education.[4] An S-shape (Figure 1.b) indicates that improvements at both the very low and the very high ends are harder to achieve. The authors' intuition is that, at very low levels of development, only a few people have access to social services that support improvements in well-being, and countries may lack the resources (financial, technological, human capital etc.) to trigger relevant investments. Attaining a 'unit' of progress is challenging. As development progresses, the resource constraint is relaxed and the share of households with access will increase at a faster rate, increasing countries' capacity to jumpstart the process through domestic and foreign resources. As with the logarithmic function, the S-shape further assumes that, once improvements cover most of the population, progress will become increasingly difficult, as those remaining are harder, and perhaps more expensive, to reach.

3 Karver et al. use a logarithmic model for maternal and child mortality, life expectancy and mobile subscriptions and a quadratic model for secondary school completion, undernourishment, population gender disparity (0-4 years old), forest cover, alternative energy use and military expenditure.

4 This builds on earlier work by Clemens et al. (2007), who show that this trajectory applies to gender parity in gross primary enrolment and to infant mortality.

3. Method and data

This paper adds to several existing proposals focusing on measuring MDG progress.[5] For each indictor we examine, we use existing data from the past two decades to model countries' expected progress conditional on their starting point. Klasen and Lange (2012) also investigate forms that best describe progress paths looking at starting point and non-linearities, but their analysis is restricted to a small number of indicators[6] and a longer time span (1960-2009 in five-year intervals). The proposal outlined here follows a simpler methodology[7] and applies to the MDG timespan, which we believe is more appropriate for post-2015 target setting. We believe this is a 'good enough' approximation that allows for a more intuitive interpretation of the results.

Non-linearities are traditionally included using quadratic or other low-order polynomials of the explanatory variables. In other words, the path of progress would take a predetermined shape. Here, we use fractional polynomials (Box 2). This allows for an extended family of curves and for each variable to behave in a more flexible way, ensuring a better fit to the data, especially towards extreme values of the indicator we are trying to explain (Royston and Altman, 1994).[8]

We evaluate performance taking into account country starting points for each of the indicators examined plus non-linearities, without imposing any previous restrictions on how the data should behave.[9] By doing so, the method overcomes the shortcomings of the relative and shortfall measures: it is not, by construction, biased towards or against any group of countries (Gidwitz et al., 2010). On the basis of a regression, the 'deviation from fit' for each country is computed as the difference between each country's actual change and its 'expected change' (following Gidwitz et al., 2010; UNDP, 2010). The estimation takes place in three steps:

1. Estimate the path of progress, that is, the fitted curve on the basis of a fractional polynomial regression. This predicts the expected final levels of the indicator for all countries, taking into account initial levels.
2. Estimate change. Calculate the actual change each country has experienced and also the expected change based on the path of progress (i.e. its predicted final levels). Change is calculated using either the relative or the shortfall method according to the corresponding MDG target.
3. Calculate the 'deviation from fit' for each country, that is, the difference between the actual and the expected change.

By way of illustration, we examine child mortality between 1990 and 2010 (Figure 2 overleaf). The solid blue line shows the path of progress for this indicator conditioned on the 1990 level. The shape of the fitted line is clearly non-linear – appearing as an S shape. A top performer in our sample – Liberia – is highlighted. The expected change in Liberia (and any other country below the S-shaped line) was larger than was expected for a country with that starting point, implying a faster-than-average reduction in child mortality between 1990 and 2010.[10] The array of countries above and below the fitted line suggests substantial variation around the trend.

For our purposes, the most important control is the country's 1990 starting position. Other variables, including income growth (as measured by growth in per capita gross domestic product (GDP)) as well as institutional and geographical characteristics, have shown little relation to progress on non-income MDGs (Bourguignon et al., 2010). Reviews to the Commission on Growth and Development (ibid.) suggest that measurement of progress on the MDGs should take into account country specificity and initial conditions. Our approach builds on that first taken in the 2007 World Development Indicators, which compares country performance on per capita income, poverty, under-five mortality, primary school completion and access to improved water against the average rate of change of countries starting from a similar position and the regression-based method used by Karver et al. (2012).

5 See Fukuda-Parr et al. (2013); Hailu and Tsukada (2011); Karver et al. (2012); Klasen and Lange (2012); and Leo and Barmeier (2010), among others.

6 Under-five mortality, primary completion and gender equality in education.

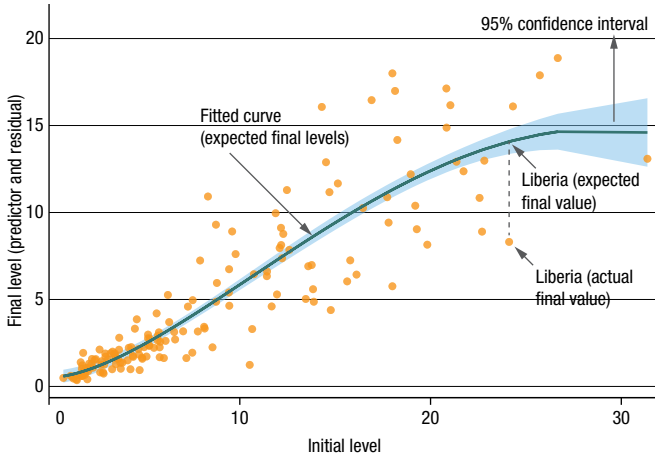
7 Klasen and Lange use a normalised and transformed indicator to estimate the transition path. For each variable, the indicator (y_{it}) is equal to -ln($\frac{1}{y^*_{it}} - 1$) where $y^*_{it} = \frac{y_{it}}{\bar{y}}$ and $\bar{y}$ is the highest conceivable value of the indicator.

8 We compare the results with those from a linear regression to assess what additional explanatory power the non-linear form provides – overall, the non-linear form provides slightly higher R2 values but the non-linear functions reflect better the performance of countries at the extremes of the distribution.

9 This methodology follows that of Gidwitz et al. (2010) and was used in UNDP (2010) to measure country performance on the Human development Index (HDI) between 1970 and 2010. They estimated the log of changes in HDI against initial levels; here we predict final levels based on initial levels.

10 For positive indicators, graphs should be read in the opposite way (i.e. countries above the line performed relatively better than the average).

Figure 2: Child mortality rate (number of child deaths under five years of age per 1,000 live births), controlling for initial levels, predicted and actual country experience, 1990-2010



Source: Author calculations using World Development Indicators (WDI) Database (2013).
Note: Fractional polynomial (2 2). Numbers in parentheses denote the degrees of power of the fractional polynomial model.

We assess progress on an indicator-by-indicator basis, in line with official sources (UNDP and World Bank monitoring reports). We focus on a narrow selection of indicators closely matching those used to track progress for MDGs 1 to 7. Because of the importance of the starting point, the years chosen to 'benchmark' progress are likely to affect measures of country performance fundamentally. For our purposes, we use the MDG benchmark of 1990. Our analysis covers the period from 1990 to 2010, this being the latest year for which a reasonable amount of information is available, and includes those countries that were classified as 'developing' in 1990 (Table 1).

A great limitation is the lack of complete and consistent data and reporting periods. First, the absence of current data means more recent progress may not be captured (Leo and Barmeier, 2010) whereas the absence of baseline data may mean an opposite bias. To address this concern, for each indicator we take into account only those countries that have data for at least the one of the first and one of the last five years (i.e. a data point between 1990 and 1994 and a data point between 2006 and 2010 inclusive), even if the procedure considerably restricts our sample in some cases.

Second, because of data gaps, the period over which progress is assessed in each country may differ slightly; for example it might be 1990-2010 or 1992-2008. To enable, as much as is possible, a uniform comparison of countries against each other, we annualise the observed rate of progress.

Taking into account these considerations, the number of countries with sufficient information is quite limited for some indicators. Particularly striking is the case of income poverty, one of the most discussed MDGs, for which only 64 developing countries have enough data to include in our analysis.[11] Moreover, many indicators are modelled based on limited information. For example, information on sanitation coverage is not often available for every single year, but rather for a few

Box 2: Fractional polynomials

A commonly used option to account for **non-linearities** is to transform the predictor variable. Quadratic (x^2), cubic (x^3) and logarithmic (log x) polynomials are often used. However, this approach provides limited flexibility in capturing non-linearities, particularly at extreme values of the distribution (Royston and Altman, 1994).

Data-driven options to find the best fit:

- Instead of pre-assuming the functional form, a data-driven approach can be used to select the best-fitting form. Fractional polynomials allow this, introducing a wider set of functional forms. The polynomial would take the following form: $FP1 = \beta_1 x^p$; $FP2 = \beta_1 x^p + \beta_2 x^q$ or $FP2 = \beta_1 x^p + \beta_2 x^q \log(x)$. FP1 is a fractional polynomial with only one power whereas FP2 includes two powers.[i] In theory, an infinite number of functions can be considered; in practice, we limit ourselves to *nk* values that are integers between -2 and +3.The power of the polynomials (p and q) is commonly chosen within the set {-2, -1,-0.5, 0, 0.5, 1, 2, 3}.
- The variable can take the form of a quadratic function (if p=2), a logarithmic function (p=0), a square root function (p=0.5) or a linear function (p=1). Simple functions are preferred; more complicated functions are accepted only if the fit is much better (Sauerbrei et al., 2006).
- All possible values of p and q are tested. The best-fitting model, in terms of both degree (FP1 or FP2) and powers (p and q), is that with the highest likelihood or, equivalently, the lowest deviance.
- The main concern when using fractional polynomials is the possibility of over-fitting the model, leading to poor predictive value because of exaggeration of the influence of minor fluctuations in the data. Investigations of the stability of the method have led to reassuring results (Dupont, 2010; Sauerbrei et al., 2006) and the method has been increasingly applied since Royston and Altman introduced it in 1994.

[i] The use of FP1 and FP2 is a special case of the more general mth-order fractional polynomial regression.

11 Coverage of poverty data exceeds 50% of countries only in South Asia and Latin America and the Caribbean.

Table 1: Indicators and data availability

MDG	Target	Indicator	Source	Data availability (number of developing countries)
1	1.a Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.	Population below $1.25 (PPP) per day	WDI (April 2013 update) Estimates from World Bank Development Research Group	64
2	2.b Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course in primary schooling.	Net enrolment ration in primary education	UNESCO Institute for Statistics	75
3	3.a Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015.	Gender parity index in school life expectancy (primary to tertiary)	UNESCO Institute for Statistics	67
4	4.a Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.	Under-five mortality rate	WDI (April 2013 update) September 2012 estimates developed by the UN Inter-Agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA, UNDP)	159
5	5.a Reduce by two-thirds, between 1990 and 2015, the maternal mortality rate.	Maternal mortality ratio	UN Maternal Mortality Inter-Agency Estimation Group (WHO, UNICEF, UNFPA, World Bank)	142
6	6.a Have halted by 2015 and begun to reverse the spread of HIV/AIDS.	HIV prevalence	UNAIDS report on the global AIDS epidemic 2010	119
7	7.c Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.	Population without an improved sanitation facility	WDI (April 2013 update) Estimates from WHO and UNICEF Joint Measurement Programme for Water Supply and Sanitation	138

points in time. The World Health Organization (WHO) and UN Children's Fund (UNICEF) Joint Monitoring Programme estimates sanitation coverage for all years in between two actual data points. Data on mortality are also estimated using nationally representative data from vital statistics and household surveys. These are adjusted and a statistical model is used to derive a smoothed time series for neonatal, infant and under-five and maternal mortality.

For each indicator, once the shape of the trajectory of progress is estimated, we analyse the relative rate of change or the shortfall reduction as stated in the MDG target compared with the country performance that emerges using this regression-based method.

4. Results

Schoolboy in Lesotho. Photo: © John Hogg for the World Bank

4.1 The different paths of progress

We find that non-linearities typically matter.[12] When the path of progress is linear, as in MDG 1, the rate at which change occurs is the same for all countries, regardless of their initial poverty level. When the path of progress is non-linear, progress will occur at different rates for different countries, depending largely on their initial levels of deprivation. Table A1 in the Annexe presents the fractional polynomial regression results.

Table 2 illustrates the expected marginal rate of change on the MDG indicators for selected percentiles of each distribution, that is, for selected starting positions.[13] The sign of the change indicates whether, over the 1990-2010 period, the indicator was predicted to increase or decrease. The slope indicates the rate at which change happened for countries at different starting points,[14] the higher the slope, the steeper the curve and the faster change occurs. For MDGs 1, 4, 5, 6 and 7, where the targets aim at a reduction (in poverty, under-five mortality, maternal mortality, HIV/AIDS and lack of sanitation), higher percentiles indicate distance from the MDG target; a country in the 100th percentile on MDG 1, for example, would have a very high initial poverty rate (93%). For MDGs 2 and 3, where the targets aim at an increase, the reverse holds true. A country in the 100th percentile on MDG 2 would have close to universal school enrolment, so its starting position would be nudging the MDG target.

We look more closely at each MDG indicator in turn.

MDG 1: Eradicate extreme poverty and hunger

Under MDG 1, Target 1.a focuses on reducing by half the share of people living under the $1 per day poverty line.

12 A simpler (i.e. linear) model is always preferred to a more complex one. Overall, the non-linear form provides slightly higher explanatory power (R-squared) and is more sensitive to the performance of countries at extremes of the distribution. The R-squared of the models ranges from 0.49 (primary enrolment) to 0.90 (sanitation coverage) except for MDG 6 (HIV/AIDS prevalence), where it is 0.35.

13 This is equivalent to the slope of the fitted curve. The slope is the change in the 'expected' final level per one unit increase in the initial level of each indicator, at different percentiles of the distribution.

14 That is, the change in final level of the indicator over the change in the initial level.

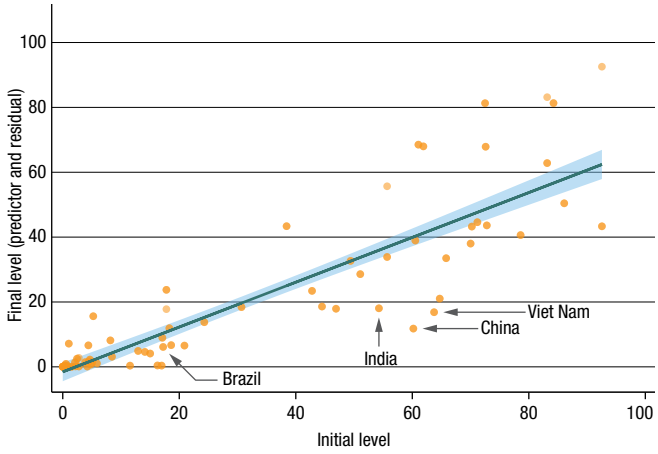
Table 2a: Direction and speed of change by selected percentile - MDGs seeking a reduction from high initial levels

Percentile	MDG 1 Reducing poverty		MDG 4 Reducing under-five mortality		MDG 5 Reducing maternal mortality		MDG 6 Reducing HIV/AIDS		MDG 7 Reducing lack of access to sanitation	
	Change	Slope	Change	Slope	Change	Slope	Change	Slope	Change	Slope
5	↓	0.65	↑	0.16	↓	3.30	↑	21.44	↑	0.08
25	↓	0.65	↓	0.25	↓	2.12	↑	21.44	↑	0.08
50	↓	0.65	↓	0.43	↓	1.07	↑	21.44	↑	0.42
75	↓	0.65	↓	0.66	↓	0.57	↑	9.40	↓	0.96
95	↓	0.65	↓	0.69	↓	0.73	↑	1.32	↓	1.10
100	↓	0.65	↓	0.43	↓	1.40	↑	0.27	↓	0.97

Table 2b: Direction and speed of change by selected percentile - MDGs seeking an increase from low initial levels

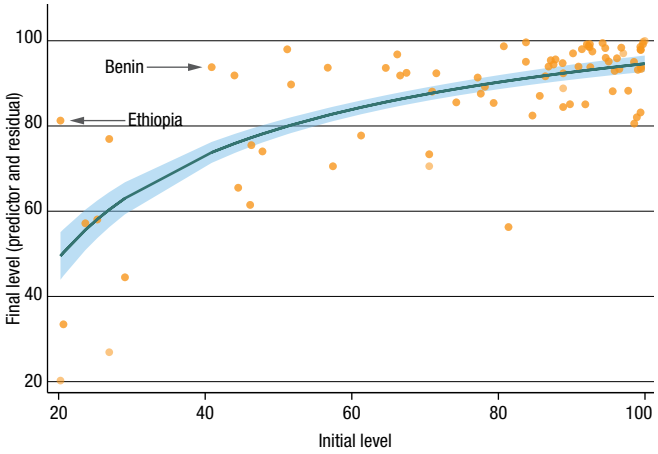
Percentile	MDG 2 Increasing enrolment		MDG 3 Increasing gender parity	
	Change	Slope	Change	Slope
5	↑	1.63	↑	0.84
25	↑	0.62	↑	0.75
50	↑	0.26	↑	0.55
75	↑	0.21	↑	0.41
95	↓	0.19	↑	0.32
100	↓	0.19	↓	0.16

Figure 3: Relative change (annual %) in $1.25 a day poverty rate, predicted and actual country performance, 1990-2010



Source: Author calculations using World Development Indicators (WDI) Database (2013).
Note: Fractional polynomial (1). Number in parentheses denotes the degree of power of the fractional polynomial model.

Figure 4: Relative change (annual %) in primary school net enrolment rate, predicted and actual country performance, 1990-2010



Source: Author calculations using UNESCO Institute for Statistics Database (2013).
Note: Fractional polynomial (-.5). Number in parentheses denotes the degree of power of the fractional polynomial model.

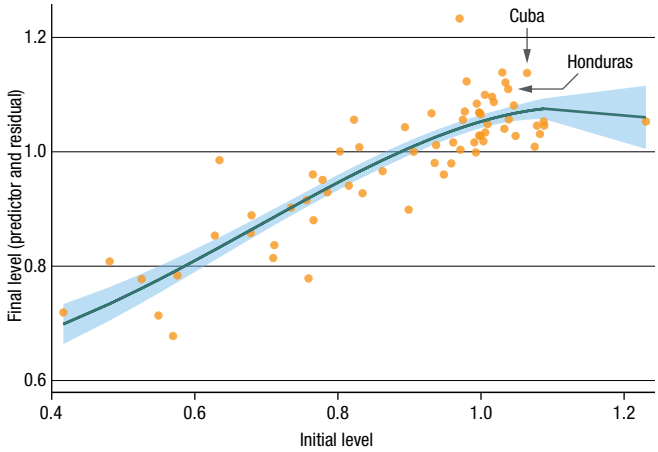
A linear model fits these data best (Figure 3), predicting about 74% of the variation in 2010 poverty levels. In other words, on average, countries managed equal reductions in poverty regardless of their starting point.

MDG 2: Achieve universal primary education

Target 2.b measures progress towards universal primary education in terms of net enrolment rates.[15] The best-fitting model for this target is concave (Figure 4) – it explains around 50% of the variance in 2010 enrolments. Where primary enrolment was initially very low, improvements were predicted to occur at a relatively fast rate, but expected progress declined progressively and even

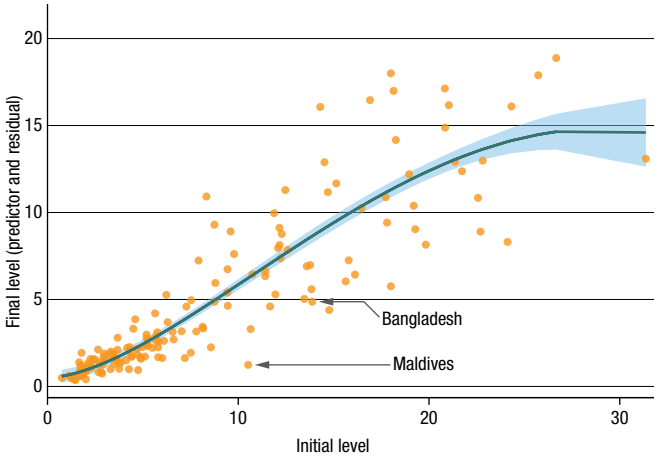
15 Net enrolment is the share of official primary school-age children who are enrolled in primary education. The gross enrolment rate includes children of all ages enrolled in primary education, so it also captures under-age and over-age enrolment.

Figure 5: Shortfall reduction (annual %) in gender parity in school life expectancy (primary to tertiary), predicted and actual country performance, 1990-2010



Source: Author calculations using UNESCO Institute for Statistics Database (2013).
Note: Fractional polynomial (3 3). Numbers in parentheses denote the degrees of power of the fractional polynomial model.

Figure 6: Shortfall reduction (annual %) in under-five mortality rate, predicted and actual country performance, 1990-2010



Source: Author calculations using World Development Indicators (WDI) Database (2013).
Note: Fractional polynomial (2 2). Numbers in parentheses denote the degrees of power of the fractional polynomial model.

stabilised at the top of the distribution. In other words, when countries were close to achieving the 'zero target', it was much more difficult to register further improvements than in those countries where initial enrolment was lower. Examples of the latter include Ethiopia and Benin, which had relatively low initial rates of enrolment but managed to expand access to education through sustained political and financial support, as well as local-level engagement to improve service delivery.[16]

MDG 3: Gender equality and empowerment of women

The main target of progress towards this goal is parity in education. The Gender Parity Index (GPI) is the ratio of girls to boys at any level of education. We use school life expectancy from primary to tertiary levels rather than the enrolment rates conventionally used to monitor MDG 3. While enrolment rates reflect participation in a given level of education, school life expectancy is more indicative of education opportunities, in showing the average number of years of schooling a child entering school can expect to spend in the education system. Therefore, our use of this indicator is consistent with the progressive approach of the target. Although MDG progress reports assess parity in primary education, the target states that parity should be achieved up to tertiary education level by 2015.

The preferred fractional polynomial model (Figure 5) explains 75% of the variation in 2010 levels. It has a concave shape for most of the distribution, suggesting change has been progressively harder the higher the initial level; this is particularly evident in the downward tilt above 1, which suggests the expected performance of countries above this level was actually a decrease. This is corroborated by the lower slopes at higher percentiles presented in Table 2.b.

MDG 4: Reduce child mortality

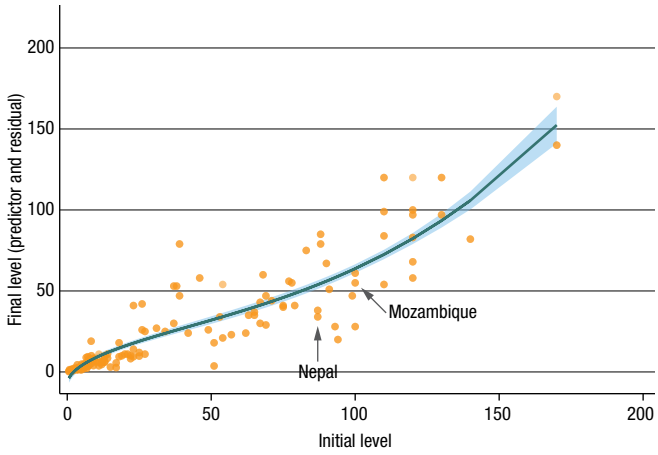
This target aims at a reduction of two-thirds in under-five mortality. The model (Figure 6) explains almost 80% of the variation in this indicator. The S-shaped curve suggests change is hardest to register at the very bottom and the very top of the distribution. Table 2a suggests reductions are highest for countries with relatively high initial levels – that is, within the 75th to 95th percentile – and they fall thereafter. Where initial rates are relatively low, gains reverse slightly. In other words, countries with relatively high levels of under-five mortality have achieved the greatest progress, and rates of progress have been harder to sustain for countries with relatively lower mortality. Our top performers are situated around the middle of the distribution.

MDG 5: Improve maternal health

The fractional polynomial regression (Figure 7) has considerable explanatory power (81%). The rate of change follows an inverted U – it is quite high for countries at the top of the distribution (with high initial levels), is relatively low at around the 50th percentile and increases thereafter (Table 2a). Countries with higher initial maternal mortality levels have typically registered stronger performance,

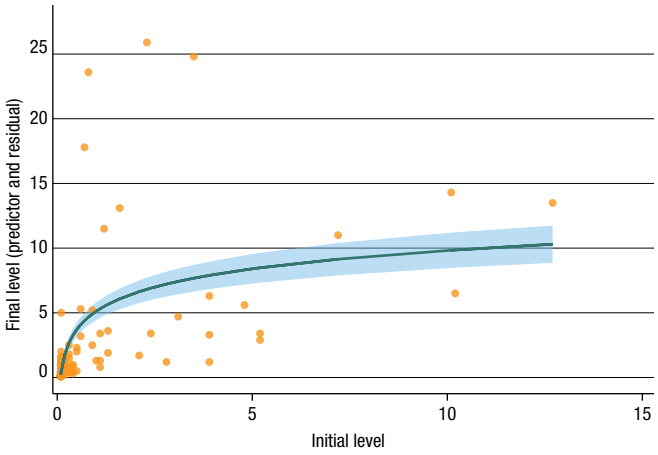
16 As described by the corresponding Development Progress Stories (http://www.developmentprogress.org/progress-stories).

Figure 7: Relative change in maternal mortality rate, predicted and actual country performance, 1990-2010



Source: Author calculations using World Development Indicators (WDI) Database (2013).
Note: Fractional polynomial (.5 3). Numbers in parentheses denote the degrees of power of the fractional polynomial model.

Figure 8: Relative change (annual %) in HIV prevalence, predicted and actual country performance, 1990-2010



Source: Author calculations using data from UNAIDS report on the global AIDS epidemic (2010).
Note: Fractional polynomial (0). Number in parentheses denotes the degree of power of the fractional polynomial model.

and it has been hardest for countries in the middle of the distribution to progress. Nevertheless, Nepal and Mozambique, strong performers that are analysed in the Development Progress case studies,[17] are in this middle section, and still show a higher-than-expected rate of progress. This reminds us that the model is indicative but not deterministic.

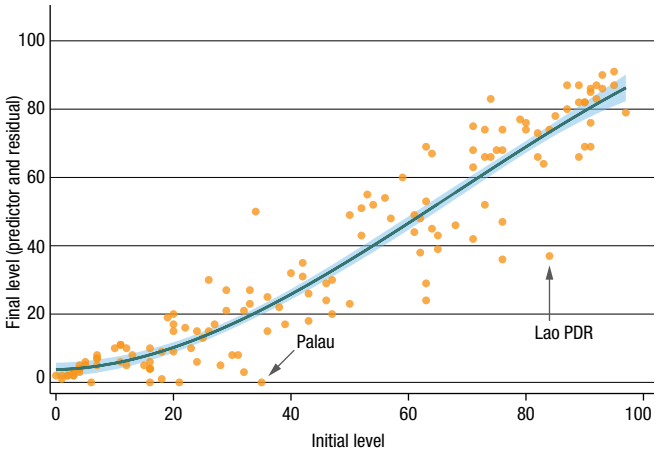
MDG 6: Combat HIV/AIDS, malaria and other diseases

Meeting MDG 6 requires at least halting or beginning to reverse the spread of HIV/AIDS. The fractional polynomial regression model preferred has only one power and takes a logarithmic form. The explanatory power (R-squared) of this model is considerably lower than those obtained for all other indicators (36%), suggesting a lack of any clear pattern of performance. That said, the experience of most countries in our sample has been an increase in HIV prevalence, rather than a reduction. This increase is expected to be very low for the bottom half of the distribution, where initial levels are high, and to decrease rapidly between the 25th and 50th percentiles (Figure 8).

MGD 7: Ensure environmental sustainability

Under MDG 7, the target of universal water access has been met at a global level five years ahead of plan, although not in Oceania and SSA (UN, 2012). Our focus is on access to sanitation, given lower 1990 coverage levels and an urgent need for improvement in almost all developing regions. The target aims at a reduction by half in the population lacking coverage. The 'deviation from

Figure 9: Relative change (annual %) in share of the population without sanitation, predicted and actual country performance, 1990-2010



Source: Author calculations using World Development Indicators (WDI) Database (2013).
Note: Fractional polynomial (2 3). Numbers in parentheses denote the degrees of power of the fractional polynomial model.

fit' model (Figure 9), has the highest predictive power (almost 90%) among the seven indicators examined. Here, progress is highest for those countries with relatively high initial deprivations, and falls markedly somewhere between the 25th and 50th percentile.

17 http://www.developmentprogress.org/publications

A child plays with his kite atop Smokey Mountain in the Philippines. Photo: © Asian Development Bank

By examining each indicator in turn, we have shown that progress is clearly not linear for a number of the MDG targets, and almost certainly for other dimensions of progress as well. For targets seeking a reduction from high initial levels, the pattern is varied. For HIV/AIDS and sanitation, progress has been harder to attain for countries relatively closer to the target, up to the middle of the distribution. For under-five mortality, progress has been hardest for those countries in the 5th and 25th percentiles. For maternal mortality, progress has followed an inverse U-shape: it is high for those countries with the highest initial deprivations, slower around the 50th percentile and then quicker again. On the other hand, for 'zero targets', which seek an increase from low initial levels, progress is harder where countries are closer to the target. This has implications both for how countries are judged against the current goals and for target setting in the future.

4.2 The impact of non-linearity on performance against MDG targets

We now compare the picture that would emerge using the traditional MDG methodology ('on track'/'off track'), with the evaluation presented in the previous section. We suggest traditional ways of computing MDG progress can incur two types of bias. False negatives occur when an actual 'hit' is mistaken for a 'miss', for example when countries perform better than predicted even when they are not 'on track' to meet their target. Conversely, false positives occur where countries have performed below expectation yet are on track to meet the targets, perhaps because the targets did not require them to make a large amount of effort. Countries that are on track to meet a target and show better-than-expected performance using the 'deviation from fit' methodology are said to show positive coincidence. Countries that are not on track and have not performed better than expected are cases of negative coincidence. Total coincidence is the sum of positive and negative coincidences.

MDG 1: Eradicate extreme poverty and hunger

Overall, the world is on track to meet MDG 1, which is the most successful of the seven indicators examined here. Indeed, 45 countries (some 70% of those with data) are on track, with 19 not. Regionally, all seven countries in East Asia and the Pacific (EAP) as well as all four in South Asia are on track. Only one country in the Middle East and North Africa (MENA) (Morocco) is off track, as are five countries in Europe and Central Asia (ECA), five in Latin America and the Caribbean (LAC) and eight in SSA. According to 'deviation from fit' criteria, 36 out of 64 countries (56%) have shown better-than-expected performance, that is, they have reduced income poverty by more than what was expected given their initial level. Seven of those are in EAP, ten in SSA, nine in LAC, five in ECA, three in South Asia and two in MENA.[18]

Given the linear pattern of progress observed on this target, there is unsurprisingly very high coincidence between the two methods: 86% of cases coincide, that is, countries are both on track to meet the relative targets and performed better than expected as assessed by the 'deviation from fit' method (56% of cases), or are not on track and did not perform better than expected (30% of cases). Some 14% of cases can be classified as false positives (i.e. they are on track despite worse-than-expected performance). There are no false negatives – that is, countries that are not on track yet showed better-than-expected performance.

MDG 2: Achieve universal primary education

Only one-quarter of countries are on track to achieve universal primary education. Many countries in LAC and in SSA are off track on this target, although Burundi, Ecuador, Ethiopia, Tanzania and Uruguay are among the top 10 performers in terms of reducing their shortfall. Using our model, 42 countries (56% of those with data) have done a better-than-expected job in terms of closing the gap in universal primary education. In 69% of cases, there is either positive or negative coincidence between the methods. All countries that are on track to meet the target have also shown better-than-expected performance using the 'deviation from fit' methodology. In other words, there are no false positive cases for this indicator. The false negatives account for 30% of cases and include three countries in EAP, five in ECA, seven in LAC, three in MENA and five in SSA. Here, therefore, the target may be encouraging a more negative view of progress than is warranted.

MDG 3: Gender equality and empowerment of women

According to the shortfall reduction, only 16 countries (24% of those with data) can be classified as on track to meet the GPI target.[19] SSA is the region with the largest number of countries falling behind, with 18 of 20 countries off track. Six countries in EAP, thirteen in ECA, five in LAC, seven in the MENA and two in South Asia are also off track. The 'deviation from fit' results are more positive than those obtained from looking at the shortfall: almost

18 Two of these countries – India and Vietnam – were case study countries in the first phase of Development Progress as a result of their great improvements in terms of poverty reduction, as was Brazil, with lower initial levels of poverty (http://www.developmentprogress.org/publications).

19 If the distribution of the population of boys and girls were equal, a GPI of 1 would indicate parity. A value less than 1 indicates a lack of parity in favour of boys and a value greater than 1 indicates a lack of parity in favour of girls. In practice, half of the country-year observations are above 1, either because girls are better off or because the population share of girls is larger than that of boys. Given this distribution, and following Klasen and Lange (2012), the GPI target is adjusted to 1.1 to calculate the shortfall reduction. If a country is above 1.1 and remains above the conceptual parity of 1 in the final period, it is classified as 'on track' to meet the target. In practice, only Lesotho exhibits this trend.

twice as many countries across all developing regions have performed better than expected given their starting points.

Fifteen countries (22%) are false negatives – off track, but with better-than-expected performance. There is only one false positive, Lesotho. The methods coincide in 69% of the cases.

MDG 4: Reduce child mortality

Progress towards MDG 4 has taken place slowly all over the world (World Bank, 2012). We find that 44% of the countries are on track to meet the stipulated two-thirds reduction in child mortality, including most countries in ECA, South Asia and MENA. In EAP and LAC, fewer countries are on track than are off track, but only in SSA is the number considerably smaller. Applying our method, 90 countries (57%) have registered better-than-expected performance in terms of reducing child mortality. Countries in ECA, MENA, EAP and South Asia register mostly positive results. In LAC, 50% of countries are performing better than expected. Only in SSA have the majority of countries performed worse than expected given their initial child mortality. For this indicator, the coincidence of the on-track/off-track method and 'deviation from fit' is large (87%). There is only one false positive country (Russia). There are twenty-one false negative countries (13% of cases), two in EAP, four in ECA, one in LAC, one in MENA, three in South Asia and ten in SSA.

MDG 5: Improve maternal health

Thirty-two countries (22% of those with data) are on track to meet the target of reducing maternal mortality by three-quarters – three in SSA, six in South Asia, six in MENA, four in LAC, nine in ECA and four in EAP. Applying our method, 57% of countries – a far higher share – have recorded better-than-expected performance including, notably, all eight countries in South Asia. Only in SSA have most countries still not performed better than expected. The two methods coincide in 61% of cases. Just 2% of the cases, all of which are in ECA, are false positives and 36% are false negatives – seven in EAP, ten in ECA, thirteen in LAC, seven in MENA, two in South Asia and thirteen in SSA.

MDG 6: Combat HIV/AIDS, malaria and other diseases

Only 23% of countries are on track to meet this target. In SSA, the region with the highest HIV prevalence, only six countries are on track, but four of the five countries with the largest relative reductions are from the region: Burkina Faso, Congo, Rwanda and Uganda.

A striking result for this target is the considerable lack of progress. In fact, in many countries, HIV prevalence increased over the two decades. As a result, a predicted increase in HIV levels could still be 'better-than-expected performance'. In this case, setting a target of halting HIV, if normatively important, was unrealistic. Indeed, the 'deviation from fit' results show that 69% of countries have shown better-than-expected performance, including all countries in MENA and South Asia. A considerably large number of countries in SSA have also performed better than expected. Of all seven MDG targets, here the coincidence of both methods is the smallest (54%). There are also no false positive cases, although the number of false negatives is the highest for all the MDGs indicators we evaluated – nearly half of countries (46%).

MGD 7: Ensure environmental sustainability

Only 27% of the countries in our sample are on track to meet the target of reducing the share of people without sanitation by half. Only two countries in SSA are on track, two in South Asia, seven in MENA, eleven in LAC, five in ECA and ten in EAP. Sixty-two countries (almost 45%) have shown a larger-than-expected reduction in the share of people living without improved sanitation: sixteen in EAP, seven in ECA, fourteen in LAC, ten in MENA, six in South Asia and nine in SSA. The methods reach similar conclusions on country performance in 76% of cases. Only four countries (3%) are false positives, two in ECA and two in MENA; twenty-nine countries (21%) distributed across all regions are false negatives.

Table 3 sums up the evidence and Table A2 in the Annexe presents results disaggregated by region. The two methods of assessing progress coincide in between 54% and 86% of cases, depending on the indicator. A lack of coincidence can reflect targets that are unfeasibly high, or conversely, too low, and is telling of the extent to which the 'shape' of progress deviates from linearity for each indicator. MDGs 1, 3, 4 and 7 show the most coincidence; it is smaller for MDGs 2, 5 and 6.

Cases of countries performing below expectations yet remaining 'on track' to meet the target ('false positives'), are few, and actually non-existent for three MDG indicators. Our analysis shows that, for all but MDG 1, the largest amount of non-coincidence is accounted for by countries performing better than expected, even when they are not on track to meet their target ('false negatives'). Putting MDG 1 aside, the share of false negatives in our sample ranged from 13% of countries for MDG 4 to 46% for MDG 6. Moreover, most false negatives are countries where deprivations are high, for example where there is low gender parity in education or high maternal mortality.[20] This illustrates the way in which the current method of measuring progress, assuming linearity, is systematically unfair to particular countries.

As the results above would suggest, for most MDG indicators, once starting points are factored into the trajectories of progress, the picture is more optimistic than that presented by World Bank and UNDP monitoring reports using the traditional tracking method.

20 The only exception is MDG 2, where most false negatives are countries where initial primary enrolment levels are relatively high.

Table 3: Summary of progress towards MDG targets – 'false positives' and 'false negatives'

Number of countries	MDG 1	MDG 2	MDG 3	MDG 4	MDG 5	MDG 6	MDG 7
Total on track	45	19	16	70	32	27	37
… and better than expected	36	19	15	69	29	27	33
… but not better than expected	9	0	1	1	3	0	4
Total not on track	19	56	51	89	110	92	101
… but better than expected	0	23	15	21	52	55	29
... and not better than expected	19	33	36	68	58	37	72
Total better than expected	36	42	30	90	81	82	62
… and on track	36	19	15	69	29	27	33
… but not on track	0	23	15	21	52	55	29
Total coincidence	55	52	51	137	87	64	105
Total number of countries	64	75	67	159	142	119	138

% of countries	MDG 1	MDG 2	MDG 3	MDG 4	MDG 5	MDG 6	MDG 7
Total on track	70.31	25.33	23.88	44.03	22.54	22.69	26.81
… and better than expected	56.25	25.33	22.39	43.40	20.42	22.69	23.91
… but not better than expected	14.06	0.00	1.49	0.63	2.11	0.00	2.90
Total not on track	29.69	74.67	76.12	55.97	77.46	77.31	73.19
… but better than expected	0.00	30.67	22.39	13.21	36.62	46.22	21.01
... and not better than expected	29.69	44.00	53.37	42.77	40.85	31.09	52.17
Total better than expected	56.25	56.00	44.78	56.60	57.04	68.91	44.93
… and on track	56.25	25.33	22.39	43.40	20.42	22.69	23.91
… but not on track	0.00	30.67	22.39	13.21	36.62	46.22	21.01
Total coincidence	85.94	69.33	76.12	86.16	61.27	53.78	76.09
Total %	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: False positive are highlighted in blue and false negatives in orange.

5. Non-linearity, progress and the post-2015 agenda

Indian voters read regional newspaperers at a rally in Mumbai. Photo: © Al Jazeera English

It is very likely that any new post-2015 goals will contain aspirations to 'get to zero' on different dimensions of poverty. Looking at patterns of progress provides valuable clues on how this can happen, and where countries need most support, including resources, to achieve the target. Educational enrolment, for example, has increased rapidly among countries with relatively high initial deprivations, but has been flatter for countries closer to zero, suggesting that sustained effort and resources may be needed to overcome barriers to education for some groups. It is notable that patterns of progress are most non-linear and coincidence is lowest for educational enrolment, maternal mortality and progress on HIV/AIDS, areas that rely most on government services and strong institutions. This has important implications for levels of investment and attempts to address wider issues around service access for excluded groups.

But, regardless of its structure and content, a critical issue for a post-2015 agreement will be how to measure performance. One of the most important lessons from the MDGs is that global targets can mobilise efforts and encourage action (Kenny and Sumner, 2011). Targets need to be challenging but not impossible. The question is how to find this middle ground – to maintain the power of a unified set of global goals while also bringing in greater sensitivity to national targets. How can targets be set in a non-linear world?

The global targets in the MDGs were set by extrapolating global trends. In a similar way, extrapolating existing patterns of progress at the national level, and using these as reference points, would provide a more realistic way of calculating the extent to which new targets might be considered attainable.

One approach could be to specify goals at the country level (Klasen and Lange, 2012). A global goal to 'get to zero' on maternal mortality could be turned into targets that are different for countries with different starting points and calibrated to the speed of progress that could

Box 3: Example of targets for a goal to end preventable maternal mortality

Experience from the past two decades indicates that the rate of change in maternal mortality rates has been relatively high for countries with higher initial levels of maternal mortality, relatively low for countries with median rates and higher again thereafter. On the basis of this evidence, reference points to assess attainable progress towards this goal between 2015 and 2030 could be:

- Group 1: Countries with over 530 maternal deaths per 100,000 live births; reduce maternal mortality by 32% between 2015 and 2030
- Group 2: Countries with a rate between 110 and 530; reduce maternal mortality by 25% between 2015 and 2030
- Group 3: Countries with a rate between 28 and 110; reduce maternal mortality by 62% between 2015 and 2030
- Group 4: Countries with a rate of less than 28; reduce maternal mortality to below 13, trying to reach zero preventable maternal deaths by 2030

be expected given their initial level. A country setting a target too low, for political reasons, for example, could be encouraged to raise its level of ambition on the basis of historical patterns along that particular dimension of progress.

However, calculating patterns of historical progress for each country would be technically cumbersome, overly complex and unlikely to be possible given data gaps. A simpler approach may be needed.

It may be more feasible to identify groups of countries for which similar rates of progress could be expected between 2015 and 2030, based on historical patterns of progress on different indicators. If this approach were to be used to inform target setting for post-2015 goals, attainable rates of progress for each group could then be identified, based on historical progress, plus a 'stretch' of, say, 10% to encourage ambition. Defining what is 'attainable' on the basis of starting points for groups of countries, rather than setting individual national targets, could provide greater coherence to the target-setting process, avoiding unnecessary complexity and helping compensate for data gaps (Box 3). This approach could be used in two ways: either as an agreed framework for determining targets or as a starting point for national-level target setting. In each case, the groups would differ for the various targets. While two countries may have similar starting points on maternal mortality, for example, and thus similar rates of progress could be expected, their starting points on educational outcomes might vary, and thus their targets for an education goal would be different. There may be reasons why individual countries would deviate from historical patterns and choose to be more ambitious in their national targets, but this approach could provide a starting point for a discussion about national-level rates of progress towards global goals.

6. Conclusions

Woman posing with her grandson at RDT Maternity Center, Anantapur. Photo: © Pepe Pont

MDG measurement has been divorced from countries' actual potential to make progress, based on historical experience, at the country level (Karver et al., 2012). The way the global targets in the MDGs have been translated to the national level has had profound implications for how progress has been assessed.

In the context of the MDGs, the methodology here shifts the question that is usually asked when thinking about how countries are faring. The traditional approach is to ask if the MDGs will be achieved by 2015. Here, we change the frame and ask, 'What progress has been made towards the MDGs?'

This paper has provided a systematic analysis of country performance on seven MDG indicators, one for each of the first seven goals. We show that taking into account starting points and accommodating non-linear performance could give rise to a significantly different accounting of performance across the MDGs, and we discuss the implications of such a strategy. The divergence between the two methods gives rise to a discussion of the challenges of reconciling country specificity with the value of a small, coherent set of global targets. We suggest that the evidence as to how progress has occurred since 1990 supports a middle ground of setting so-called aspirational goals with shorter-term country- or group-specific targets.

More nuanced measurement of country performance that takes into account starting points and non-linearities gives insights into progress pathways, showing where and at what rate progress is occurring between countries, and suggests possible constraints along these paths. This focus on progress would help bridge the gap between expectations and achievements.

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Annexe

Table A1: Fractional polynomial results

	MDG 1	MDG 2	MDG 3	MDG 4	MDG 5	MDG 6	MDG 7
Var_1	0.650***	-102.538***	0.449***	5.345***	54.216***	2.039***	1.637***
Std. error	0.034	8.45668	0.0290067	0.246	3.641	0.1765478	0.119
Var_2			-0.983***	-3.423**	17.088***		-0.079***
Std. error			0.1241478	0.266	1.793782		0.013
Constant	19.355***	89.802***	1.002***	4.794***	25.890***	4.966***	31.165***
Std. error	1.002	0.790	0.006	0.142	1.064	0.3373998	0.862
R-squared	0.7496	0.4983	0.7575	0.8004	0.8128	0.3611	0.862
Adj R-squared	0.7476	0.4949	0.7538	0.7991	0.8114	0.3584	0.8978
n	128	150	134	318	284	238	278
Deviance not in model	1159.903***	1200.678***	-206.432***	1882.877***	2735.215***	1418.076***	2670.76***
Deviance linear	982.678	1111.403***	-380.231***	1386.611***	2278.735***	1348.67***	2073.5***
Deviance best m=1	982.678	1097.204	-384.043**	1386.611***	2278.735***	1311.435	2072.785***
Deviance best m=2	979.452	1095.609	-396.26	1370.483	2259.399	1308.211	2036.801
Best powers of var among 44 models fit	1	-0.5	3 ; 3	2 ; 2	0.5 ; 3	0	2 ; 3

*Note: *** p<0.001 **p<0.05 *p<0.10*
Significance from deviance difference comparing reported model with m=2 model.

Table A2: Regional summary of progress towards MDG targets, number of countries

		MDG 1		MDG 2		MDG 3		MDG 4		MDG 5		MDG 6		MDG 7	
		Better than expected													
Region	On track to meet MDG	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
EAP	N	.	.	2	3	5	1	11	2	5	7	3	5	8	6
	Y	.	7	.	3	.	2	.	11	.	4	.	4	.	10
ECA	N	5	.	4	5	11	2	5	4	12	10	8	11	10	4
	Y	2	5	.	3	.	6	1	21	3	6	.	7	2	3
LAC	N	5	.	7	7	5	.	16	1	10	13	8	11	15	3
	Y	3	9	.	3	.	5	.	15	.	4	.	5	.	11
MENA	N	1	.	3	3	3	4	6	1	2	7	.	6	2	5
	Y	2	2	.	4	.	1	.	9	.	6	.	2	2	5
South Asia	N	.	.	.	.	.	2	.	3	.	2	.	4	1	4
	Y	1	3	.	.	.	.	.	5	.	6	.	3	.	2
SSA	N	8	.	17	5	12	6	30	10	29	13	18	18	36	7
	Y	1	10	.	6	1	1	.	8	.	3	.	6	.	2

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Development Progress is a four-year research project which aims to better understand, measure and communicate progress in development. Building on an initial phase of research across 24 case studies, this second phase continues to examine progress across countries and within sectors, to provide evidence for what's worked and why over the past two decades.

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