SYSTEM FOR MONITORING IMPLEMENTATION OF TARGETS: Present MDGs and Post-2015 SDGs

Innovative Additional S-Time-Distance Method for Measuring Inequality and Implementation of Targets at World, National, Local, and Business Levels

Millennium Development Goals

Sustainable Development Goals

Pavle Sicherl

SYSTEM FOR MONITORING IMPLEMENTATION OF TARGETS: Present MDGs and Post-2015 SDGs

Innovative Additional S-Time-Distance Method for Measuring Inequality and Implementation of Targets at the World, National, Local, and Business Levels

PAVLE SICHERL

Gaptimer Report No. 4

Ljubljana, July 2015

Layout and Figures: Jaka Hajnšek

FOREWORD

Inequalities in the world, between and within countries, are together with environment the critical issues for the 21st century. The Millennium Development Goals (MDGs) are coming towards conclusion and the international community is deciding on the scope and the timetable for a set of sustainable development goals (SDGs).

Better governance needs many things but also better data and tools for fact based decision making. The art of handling different views of data is crucial for discovering the relevant patterns and for providing a broader framework for policy and business analysis. Sustainable development is by definition a long-run and multi-dimensional phenomenon. Semantics of discussing the issues, in setting the targets and in the implementation should not be based only on static measures; it needs to be complemented by dynamic measures. S-time-distance measure presents an innovation that goes beyond the present state-of-the art in measuring the degree of inequality thus increasing the understanding of the situation in the time perspective.

Seeing with new eyes creates new knowledge and better understanding. The relations between efficiency, growth, disparity, and equity are in this conceptual framework more pronounced than in the conventional analysis (Sicherl, 1992), the later being mostly based on relative static measures of inequality (Atkinson and Brandolini, 2004 and Sicherl, 2004a).

Time distance methodology can be very helpful both in the preparation of the post-2015 agenda as well as in the continuous monitoring of implementation of selected indicators later, both on the aggregate and national levels. The first step in building any strategy is the assessment of the starting position, for which statistical data and analysis are a precondition for substantive debate and policy decisions. This methodology proposes that the overall degree of inequality depends on two dimensions: distance between compared units at a given point in time and distance in time for a given level of the indicator. A hypothesis can be formulated that, ceteris paribus, increased tensions in the current crisis may be partially a result of an increase in overall disparity through increased time distances brought about by lower growth rates.

As a contribution to the post-2015 discussions the time distance method will be used in two aspects: for benchmarking the starting situation in the world in the time dimension and for monitoring the implementation of the MDGs, both for the lessons from the past and as possible complementary monitoring method for the post-2015 period. The empirical results based on recent data on MDGs in this study will show updated implementation over that for 2010 in my article on Gaptimer Progress Chart published by The Guardian on their Global development web site (Sicherl, 2013a).

Potential users of this methodology could be international and national organizations, NGOs, experts, businesses, managers, educators, students, interest groups, media, and the general public at the world, national, and sub-national levels.

Ljubljana, July 2015 Pavle Sicherl

TABLE OF CONTENTS

Chapter 1

INTRODUCTION

At the 2013 Global Forum on Development at the OECD in Paris in the session 'Innovative approaches to measuring poverty, well-being and progress, and implications for statistical capacity development' organizers put the question how statisticians can take advantage of innovations in data production and dissemination. It is important to emphasise that in the chain of reasoning Statistics – Knowledge – Policy in addition to data and indicators we need also more work on measures and methods used to build perceptions about development and inequalities. This includes innovations in introducing new statistical measures that are transparent and easily understood by everyone in order to foster dissemination for policy use and to build transparency for broader participation of stakeholders. Measurement is costly and it is important how efficiently we exploit existing data for such purposes.

The S-time-distance methodology opens new dynamic vistas of development and inequalities in the world. Empirically, when comparing across indicators and across time, static and S-time-distance measures can give different perceptions of the order of magnitude of inequality within and between countries, so both dimensions matter. The time distance dimension of measuring the degree of inequality combined with well established international or national databases can test and observe what additional new insights could be established with the novel method.

The applications of the time distance methodology fall in two main categories. The first is application in statistics, by adding two generic measures (S-time-distance and S-time-step) to the present state-of-the-art of measuring differences between time series that can be used both as descriptive tools and in analysis of goodness-of–fit; with possible further applications in other domains. On the scientific side, the fact that the Nobel Prize winner C. Granger extended the use of S-time-distance measure to econometric forecasting is an evidence of the generic capability of the idea.

The second application is for better understanding of the information embodied in time series data to wider audiences, providing new perceptions for building knowledge and for discussing policy and business issues. The concept of time distance allows the second complementary dimension for comparison, visualisation and evaluations in addition to the conventional static difference in levels for a given point in time. This second dimension is the difference in time when the two compared units achieved the same level of the analysed indicator. Expressed in time units it is easily understandable to all, from policy makers, experts, and media to the general public. It also provides broader semantics for policy debate and management decisions as well as broader dynamic presentations of reality.

Sicherl (2011a) discusses the concept of 'overall degree of disparity', arguing that disparities in society depend not only on static measures of inequality but also on time distances. Further discussion on inter-temporal aspect of wellbeing is in Sicherl (2014a) in the Springer Encyclopedia of Quality of Life and Well-Being Research. Such a broader concept of the overall degree of disparity can lead to a different perception of the extent of disparity than the conventional static measures alone.

Sicherl (2012) presents a simple example of comparing two countries or regions or social groups for a given indicator, assuming two scenarios. Scenario A assumes growth rate of 4%, and scenario B growth rate of 1%, for simplicity reasons both units are growing at these constant rates of growth. The value of the indicator for region 1 is 50% higher than that of region 2 in both scenarios. If one uses for the evaluation of the magnitude of the gap between the two regions the conventional statistical measures like ratio, percentage, Gini coefficient, Theil index, these two scenarios show the same degree of disparity. Taking the broader view of the situation (with the concept of time distance as one of the dimensions of disparity) this leads to a different conclusion about the degree of disparity in scenario A and in scenario B. In the 4% growth rate for scenario A with the 50% static disparity the time distance between the two compared units, countries, regions, or social groups is 10 years, in scenario B with 1% growth rate the time distance between the compared units is 40 years. It is highly unlikely that people would perceive such situations (combination static 50% and 10 years or static 50% and 40 years, respectively) as equal degrees of inequality as would be suggested by conventional static measures.

Chapter 2 presents the methodology of S-time-distance measure as additional perspective in measuring inequalities, with the emphasis on definitions and on several benefits of the S-time-distance view for additional insights for development and wellbeing measurement and policy debate. The empirical example is comparing the life expectancy for 13 selected countries over the whole span of HDI countries, from Norway to Niger. Static difference for life expectancy in Sweden is about 10 percent higher than in China or 32 percent higher than in Niger; this perception can be usefully complemented by the S-time-distance measure showing that the present values in these countries were attained in Sweden about 50 and 107 years ago, respectively. The former static differences may appear to be small, while S-time-distance measure gives a very different perception of the magnitude of the gap.

Chapter 3 S-time-matrix presentation offers an additional format for presenting and visualisation of official time series data across many units and years related to the levels of the analysed indicator. It is discussed how the conventional table formats can be transformed into additional time dimension complementary formats, to complement rather than replace the currently predominant relative static measures of inequality. Examples are given at the world regions as well as at the country level.

Chapters 4 and 5 present the core of the empirical analysis of implementation of the MDGs goals against the line to the 2015 targets. Chapter 4 deals with the analysis of time distance implementation for world regions and China and India for 10 selected MGD indicators, followed in Chapter 5 with the analysis at the country level of the S-time-distance results of MDG implementation over up to 154 developing countries for five selected indicators.

Chapter 6 summarises important elements of the innovative additional S-time-distance method for monitoring implementation of post-2015 sustainable development goals. This study concludes that the proposed system for time distance monitoring implementation of targets is applicable for many areas and levels, and that the detailed empirical application to the ongoing MDGs makes it immediately operational for the indicators of the post-2015 SDGs.

Conclusions and Appendix with electronic supplementary material conclude the study

Chapter 2

S-TIME-DISTANCE PERSPECTIVE LOOKING AND SEEING WITH NEW EYES

Methodology: S-time-distance measure as additional perspective in measuring inequalities

S-time-distance is an innovative approach for looking at time-series data. Expressed in time units, the approach is easy to understand, and provides new insights as a useful complement to existing mostly static methods. The approach is universal, understandable, and applicable to a wide variety of fields at both the macro and micro levels. Since time distance view provides an additional dimension of temporal disparity, results by other methods are left unchanged but new overall conclusions can be reached.

Several benefits of the S-time-distance view for additional insights for development and wellbeing measurement and policy debate

1. Novel generic measure for comparison of time series data between two or more units

In general, time distance concept can be applied as an additional view of the time series data. They can be notionally compared in two obvious directions: for a given point in time and for a given level of the variable (e.g. indicator). In graphic terms, the former static measures compare time series in the vertical dimension, while S-time-distance compares time series between two or more units in the horizontal dimension.

The time perspective is here systematically introduced in comparative analysis both as a concept and as a quantifiable measure. Existing methods of comparative analysis do not take into account that, in addition to the disparity (difference, distance) in an indicator at a given point in time, in principle there exists a theoretically equally universal disparity (difference, distance) in time when a certain level of the indicator is attained by the two compared units.

The statistical measure **S-time-distance** is a special category of time distance measures and it measures the distance (proximity) in time between the points in time when the two series compared reach a specified level of the indicator X.

S-time-distance for a given level of X_L is defined as:

$$S_{ij}(X_L) = \Delta t(X_L) = t_i(X_L) - t_j(X_L) \qquad (1)$$

For instance, in Figure 1 we take the example of gender disparities in life expectancy at birth for EU27 aggregates. The static view compares time series at a given point in time, i.e. in our case the static gap in life expectancy between women and men in 2010. The absolute difference amounted to 5.9 years; the index was 107.7. Comparing for a given level of the indicator, life expectancy for men in 2010, as a

reference level of the indicator, was reached by women already in 1983 (i.e. 27 years earlier): S-time-distance amounted to 27 years.

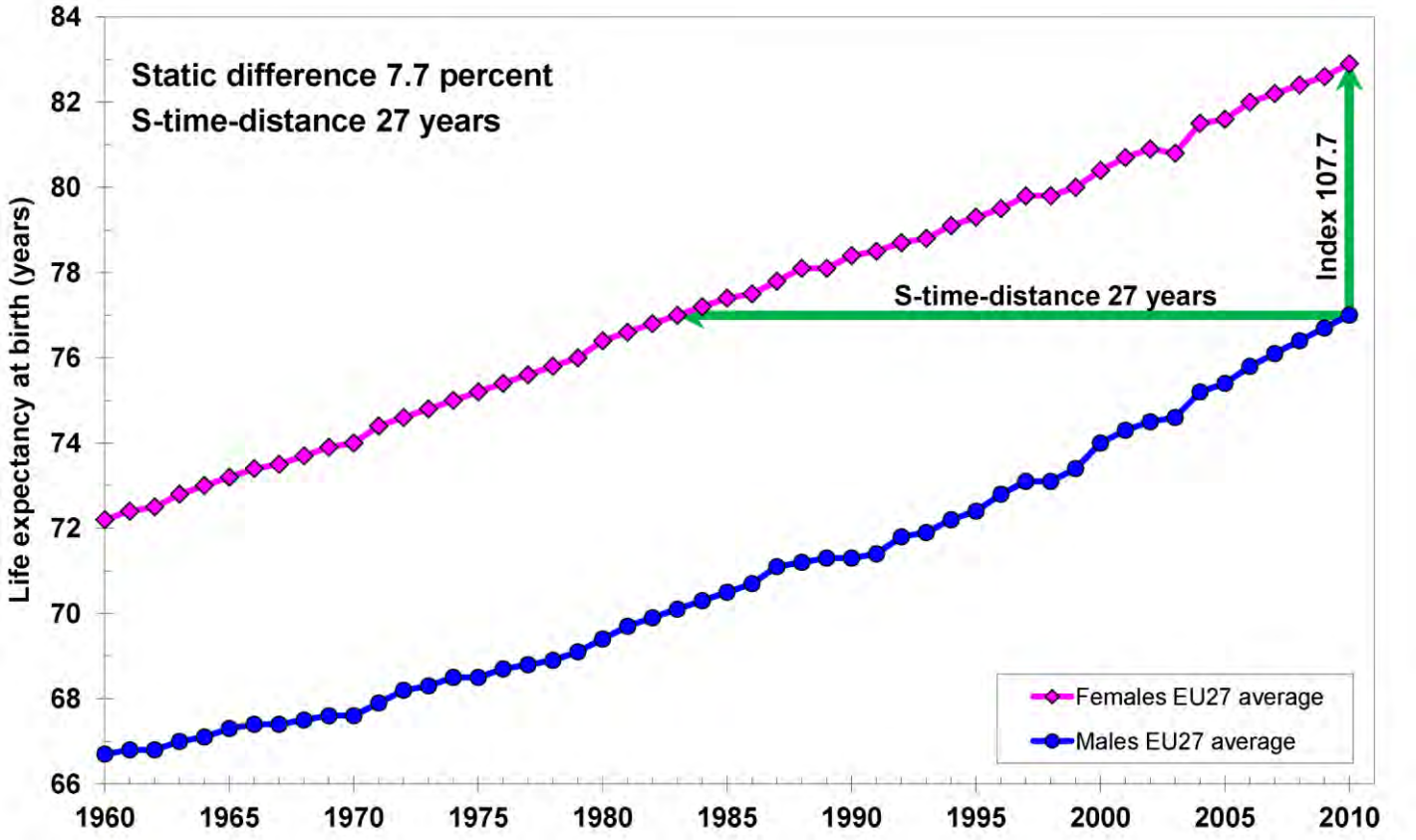


FIGURE 1 Gender disparities in life expectancy at birth, EU27 average in 2010: static index and time distance

SOURCE: Own calculations based on Eurostat (2006, 2013a).

The figure illustrates these two dimensions of gender disparities in life expectancy and indicates that perceptions of the size of this gap can be very different depending on the statistical measure used. Here the static difference between two lines in 2010 is less than 8 percent (which may appear to be small) while the time distance is 27 years (which gives a very different perception of the magnitude of the gap).

In the field of statistics the theoretical underpinning of S-time-distance as a novel generic statistical measure is originating from the idea that a time series analysis could be fruitfully performed also in the horizontal dimension, i.e., for a given level of the indicator. This idea led to the introduction of the S-time-distance concept as a measure of disparities in economic and social development (Sicherl 1973), but has over the years evolved towards a much more general approach.

Events are dated in time, therefore in time series comparisons, regressions, models, forecasting and monitoring, the notion of time distance was always there as a 'hidden' dimension. In such a capacity it can be used to analyse a variety of problems beyond the applications in this study that is concentrated on the applications in benchmarking and monitoring that is related to the most obvious topics in measuring inequalities and monitoring implementation for MDGs and SDGs. As mentioned before, on

the scientific side, the fact that the Nobel Prize winner C. Granger extended the use of S-time-distance measure to econometric forecasting is an evidence of the generic capability of the idea.

> *"The usual metrics for comparing two lines involve differences along the vertical axis. This can be a poor way of measuring how these trends vary in terms of time, which is on the horizontal axis. When we compare trends lines based upon horizontal differences, we are measuring time distance: that is, the difference between the two lines is expressed in a measure of time (such as years or months). As Sicherl (1973, 1993) proposes, for a given level of the lagged or leading indicator, a time distance measures distance in time between the indicator and the indicated variable. Observed time distance is a dynamic measure of temporal disparity between the two series, intuitively clear, readily measurable, and in transparent units which are comparable across a pairing of indicators and indicated variables. It is suggested that one should complement conventional vertical measures with horizontal measures."*
> C.W.J. Granger and Y. Jeon, University of California at San Diego (1997)

The **S-time-step** measures the time elapsed between two levels of a time series, providing an alternative description of its growth rate, measuring the growth of a series by using the inverse relation to the conventional $\Delta X/\Delta t$ growth rate metrics. For instance, in the analysis of dynamics of life expectance for HDI the very high human development group needed in the past about 5.5 years to increase the life expectancy from 79 years to 80 years; this is a complementary description of the dynamics of life expectancy to the conventional growth rate matrix, which would described the dynamics as about 0.2 percentage per year. Both measures are valid description of the dynamics of change, while for general public S-time-step might be even easier to understand. **S-time-step** is expressed in units of time and is defined as:

$$S_i\,(\Delta X_L) = [t_i\,(X_L+\Delta X) - t_i\,(X_L)]/\Delta X \qquad (2)$$

2. S-time-distance is a special category of time distance measure with several applications

Application of S-time-distance measure was introduced in Sicherl (1973) as a dynamic measure of disparities in social and economic development as a special category of time distances that are defined for a given level of the indicator; in this specific application we are talking of the generic statistical measure. There are many other notions of time distance. In spatial analysis time distance may mean the time needed to come from one point to another point in space. The recent speeding up of communications may in the case of information and other communications mean 'the death of distance' (Cairncross, 1998), i.e. that, with the existing differences in space; the time distance of delivery has been drastically shortened.

Time and money are the most broadly used comparators and reference frameworks in modern society. S-time-distance as measure of disparities is an important comparative and communication concept and tool. Namely, time is a tremendously important non-material resource for individuals, communities and nations; available time of 24 hours per day is the most equally distributed resource in the world.

Technically, S-time-distance can be used to analyse a variety of problems beyond the applications in this study, like in time series comparisons, regressions, models, forecasting, monitoring, and describing scenarios. Many of these possible applications will not be dealt with in this study.

3. Being expressed in time units it is easy understood by everybody

People have memories of the past and expectations about the future; they compare over many dimensions and over time. This explicitly or implicitly introduces the concept of inter-temporal aspect of well-being. People understand time and people feel time; S-time-distance measure of disparities may contain more emotional content than indices or percentages.

American philosopher Ken Wilber underlines that time (calendars and clocks, hours, minutes months, years) represent mental software that people can use each and every day without giving them a second thought (Wilber, 2013).

4. Adds a new dimension of understanding and perception of the degree of inequality, perceptions of wellbeing and progress are inherently subjective.

The perception of wellbeing and of the degree of disparity is subjective. For realistic evaluation of the situation we need both types of measures, static measures and time distance. Sicherl (2011a) discusses the concept of 'overall degree of disparity' defined as proximity in the indicator space as well as in time, which has the potential to bring new additional understanding for numerous issues in economics, management, research, and statistics. Further discussion Inter-Temporal Aspect of Wellbeing is available in Sicherl (2014a) in the Springer Encyclopedia of Quality of Life and Well-Being Research. Different people will give different subjective weights to the static and time distance dimension of disparity and they might be also very different for different indicators.

5. Empirically, when comparing across indicators and periods of time, static and time distance measures of disparity can differ significantly.

Differences between relative static and dynamic disparities can be very large comparing different indicators or between different periods with very different growth rates. For instance, Type I processes (like live expectancy) are characterised by low relative static disparities, low growth rates and large time distances. In contrast, Type III processes (like ICT indicator fixed broadband subscribers) are characterised by high static disparities expressed in percentage terms, and small time distances due to high growth rates (see Figure 5).

6. Has the potential for telling new stories and give additional view in terms of:

- Types of analysis (benchmarking, target setting, monitoring and goodness-of-fit) for different fields of concern (like income and wealth, employment, education, health, poverty, consumption, productivity, wages, key performance indicators).

- Types of indicators (economic, social, environment, technological, business, etc.); at various levels (world, countries, regions, urban and rural areas, cities; economic, social or ethnic groups; sectors, industries, corporations, projects).
- Enhanced semantics for policy analysis and public debate; a broader framework for interrelating growth, efficiency, inequality and convergence.
- A presentation and communication tool available to decision makers, civil society, and management to describe situations, challenges and scenarios
- Additional exploitation of databases and indicator systems, including simple visualisation."

Source: Sicherl (2011a)

7. For applications there is no need to collect new data, it can use existing data and indicator systems from international, national, regional, business and local sources.

The strength of the time-distance concept is that it enables additional exploitation of data and visualisation of time series. S-time-distance is a generic concept, it transforms original available data to the new measure in this additional dimension (in the same way as static difference and growth rates), and thus provides an additional view to many problems and applications.

Example of application: World inequalities in life expectancy at birth

We shall use the indicator life expectancy at birth in this predominant methodological chapter for two reasons. Firstly, life expectancy is a very important indicator of wellbeing and via direct transformation into health index it represents one of the three component indices of the Human Development Index (HDI). Secondly, the discussion in terms of life expectancy provides very understandable new information of the time distance perspective in this indicator without being influenced by the assumptions of the transformation procedures in calculating other indices in the HDI framework.

S-time-distance measure is complementing rather than replacing the existing mostly static measures. It is a generic approach, expressed in time units, easy to understand. S-time-matrix (further discussed in Chapter 3) is an original possibility of additional presentation of time series data. In the usual time series table data of the indicator (e.g. life expectancy) are organised in relation to the descriptors, like units (e.g. countries) and time (e.g. years). The S-time-matrix presents the original data (or some approximations) in an alternative way: descriptors are units and levels of the indicator and the value in the field of the table are times when such levels were attained. Calculating these times by interpolations may pose a small problem of the degree of accuracy compared to the original data, but it offers additional understanding about the time dimension of disparities and a good summary overview.

In the S-time-matrix data are arranged by selected levels of indicators showing in which year these levels of the indicators were achieved by given country. This format of level-time matrix is easily understood by everybody, at the same time it provides also a simple visualisation tool for many units over time. The observed level-time table-graph in yellow colour shows the range of values achieved for a given country over the period from available data.

In Figure 2 the rows are defined by the levels of life expectancy at birth from 40 years to 82 years, the units of comparison are 13 countries, a selection of countries from all four human development groups for the period 1980-2012, and the long-term trend for Sweden as the comparator. The years shown in the table are the approximate time when such levels of life expectancy were attained in the selected countries.

There are several methods of calculating time distances and comparing them also with static measures, for three types of comparisons: the level of the indicators, their dynamics, and comparisons of levels relative to a benchmark (see Sicherl, 2011a). The first comparison can start with time matrix visualisation of the selected indicator over many units and over time as in Figure 2 below.

HDI Rank	1	2	45	51	90	94	101	121	136	145	146	146	186	8
LEXP Level	**Norway**	**Australia**	**Argentina**	**Uruguay**	**Turkey**	**Tunisia**	**China**	**Indonesia**	**India**	**Kenya**	**Pakistan**	**Bangladesh**	**Niger**	**Sweden**
82		**2012**												
81	**2011**	2005												**2008**
80	2006	2002												2002
79	2001	1998												1997
78	1997	1994												1992
77	1992	1991		**2011**										1987
76	1984	1987	**2012**	2006										1981
75		1983	2006	2001										1975
74			2001	1997	**2011**	**2008**								1965
73			1997	1992	2008	2002	**2009**							1958
72			1992	1988	2005	1999	2004							1953
71			1988	1983	2003	1996	1999							1950
70			1983		2001	1994	1993							1947
69					1999	1991	1988	**2010**				**2011**		1946
68					1998	1989	1984	2008				2008		1944
67					1996	1988	1980	2005				2005		1941
66					1995	1986		2001				2003		1939
65					1993	1984		1998	**2010**		**2009**	2001		1937
64					1991	1983		1995	2007		2005	1999		1932
63					1990	1981		1993	2004		2000	1997		1931
62					1988			1990	2001		1995	1995		1928
61					1987			1988	1998		1991	1993		1921
60					1985			1985	1995		1988	1991		1921
59					1984			1983	1992	1990	1984	1989		1920
58					1982			1981	1989	1992	1980	1987		1920
57					1981				1986	**2011**		1984		1919
56									1982	2009		1982		1906
55										2008			**2012**	1905
54										2006			2009	1902
53										2004			2007	1901
52													2006	1900
51													2004	1899
50													2003	1886
49													2001	1885
48													2000	1880
47													1998	1878
46													1997	1877
45													1995	1876
44													1994	1870
43													1992	1870
42													1991	1869
41													1988	1869
40													1983	1858

FIGURE 2 Time matrix for life expectancy at birth for selected countries and for benchmark Sweden
SOURCE: Own calculations based on data from UNDP (2013b), for Sweden before 1980 Mitchell (2003).

The S-time-matrix allows for quick level comparisons:

- of the situation across the selected countries
- of how many steps over levels of indicators a given country has progressed, which is an additional indication of the dynamics in the given country.

There is a wealth of information and of possible comparisons in the Figure 2 that cannot be discussed here in detail. At the glance one can visually observe that there are substantial differences in life expectancy between the analysed countries. On the other hand, as countries are ordered by the rank of the overall human development index it is clear that positions of some countries with respect to life expectancy are different than that in HDI overall index.

The UNDP database (UNDP, 2013b) covers the time series for HDI indices for the period from 1980 to 2012. The same period was taken for life expectancy in the time matrix in Figure 2 and that period can be compared to the history of Sweden as the benchmark.

Comparing horizontally, in this period life expectancy for Sweden, Norway, and Australia was in the range from 76 to 81 years, for Australia a year more in both directions. On the other hand, the range in Niger was from 40 to 55 years of life expectancy, a large increase in absolute terms but still much below more developed countries. However, at a glance it can be seen that Pakistan and especially Bangladesh are better positioned for life expectancy than for the overall HDI rank.

Comparing vertically in the time matrix the dynamics of progress of life expectancy can be visually noticed. Turkey, Niger, and Bangladesh showed the greatest number of upward steps, with increases of about 18, 16, and 14 years of life expectancy over the period. S-time-step as a measure of speed will be shown in Figure 4.

Apart from the visualisation of levels over the analysed period from the level-time matrix in Figure 2 we can derive two statistical measures, expressed in standardized units of time: S-time-distance and S-time-step. S-time-distances in Figure 3 for selected levels of life expectancy are arrived at by subtracting the respective times for a given unit and the times for the benchmark unit (long trend for Sweden) in the level-time matrix in Figure 2. For instance, the level of life expectancy of 65 years was obtained in India in 2010 and in Sweden in 1937. So the time distance at that level was rounded to about 72 years (2010 – 1937).

On the other hand, we get S-time-step (in years) by subtracting the respective times for consecutive levels of the variable for each unit by columns in the time matrix in Figure 2 and provided in Figure 4. As mentioned earlier, this is a possible measure of the dynamic characteristics of a series. For instance, in India to move from 64 to 65 level of live expectancy 2.8 years were needed (2010 = 2017). There are other possibilities for these calculations from the original data. However, the estimation from the time matrix is very simple to understand the relationships of the new insights provided by the two novel statistical measures.

The estimates of time lead or time lag from the selected benchmark in Figure 3 show that at national levels the world inequalities in life expectancy are very high. Even more, if one would use only data from the 1980-2012 period from the UNDP database (UNDP, 2013b) the highest value of the time lag that can

be determined from this data would amount to 32 years (length of the period of available data). From the selected countries in the time matrix in Figure 2 the time lag behind leaders Australia and Norway can be calculated only for Argentina and Uruguay. Namely, the next countries Turkey and Tunisia reached the level of life expectancy of only 74 years, which is less than values of Australia and Norway in the beginning of 1980's.

HDI Rank	1	2	45	51	90	94	101	121	136	145	146	146	186	8
LEXP Level	Norway	Australia	Argentina	Uruguay	Turkey	Tunisia	China	Indonesia	India	Kenya	Pakistan	Bangladesh	Niger	Sweden
82														
81	3	-3												0
80	3	0												0
79	4	1												0
78	5	2												0
77	6	4		24										0
76	3	6	30	25										0
75		8	31	26										0
74			36	31	46	43								0
73			39	34	50	44	51							0
72			39	35	52	45	51							0
71			38	34	53	46	49							0
70			35		54	46	46							0
69					54	45	43	65				66		0
68					53	45	40	63				64		0
67					55	47	39	64				64		0
66					56	47		63				64		0
65					56	47		61	72		72	63		0
64					59	51		63	75		72	67		0
63					59	50		61	73		68	65		0
62					61			62	74		68	67		0
61					66			67	77		70	72		0
60					65			65	75		67	70		0
59					64			63	72	70	64	69		0
58					63			61	69	72	61	67		0
57					62				66	92		65		0
56									77	103		76		0
55										103			107	0
54										105			108	0
53										103			106	0
52													106	0
51													105	0
50													117	0
49													116	0
48													119	0
47													120	0
46													120	0
45													119	0
44													124	0
43													123	0
42													121	0
41													118	0
40													125	0

FIGURE 3 S-time-distances (in years) indicating lag or lead behind the benchmark of long-term trend for Sweden

SOURCE: Own calculation based on data in Figure 2.

Only when we have introduced as benchmark long-term trends for Sweden we were able to indicate the perception of the magnitude of inequalities in the time distance dimension. For 2012 level of life expectancy in Niger one has to go back in the history of Sweden to find that level in year 1905, indicating the S-time-distance of about 107 years; for Uruguay and Argentina about 24 and 30 years, for

Turkey and Tunisia about 43 and 46 years, 51 years for China, around 65 for Indonesia and Bangladesh, between 70 and 72 years for Kenya, Pakistan, and India, for Niger more than 100 years. This is a new way to assess the reality by applying the novel statistical methodology.

S-time-step as an additional measure of dynamics

As explained earlier in addition to the S-time-distance measure there is also a novel statistical measure S-time-step measuring the time elapsed between two selected levels of a time series. In Figure 4 this additional measure of dynamics is shown for life expectancy, i.e. how many years were needed to reach the next level of the life expectancy.

HDI Rank	1	2	45	51	90	94	101	121	136	145	146	146	186	8
LEXP Level	**Norway**	**Australia**	**Argentina**	**Uruguay**	**Turkey**	**Tunisia**	**China**	**Indonesia**	**India**	**Kenya**	**Pakistan**	**Bangladesh**	**Niger**	**Sweden**
82		6.7												
81	4.8	3.5												5.8
80	4.3	3.6												5.2
79	4.5	3.7												5.0
78	4.5	3.7												5.3
77	7.8	4.1		5.3										5.6
76		4.2	5.5	4.3										6.1
75			5.0	4.5										9.5
74			4.5	4.5	3.5	5.8								7.7
73			4.3	4.4	2.7	3.7	4.6							4.6
72			4.6	4.3	1.9	2.5	5.5							3.6
71			4.8		1.9	2.5	5.6							2.2
70					1.7	2.5	5.0							1.9
69					1.6	1.9	4.2	2.5				3.3		1.1
68					1.6	1.5	4.2	3.0				2.8		3.5
67					1.6	1.5		3.6				2.3		2.4
66					1.6	1.5		3.0				2.3		1.1
65					1.6	1.5		2.8	2.8		4.8	2.0		5.3
64					1.6	1.5		2.8	2.9		4.9	1.9		0.8
63					1.5			2.7	2.9		4.2	1.9		3.7
62					1.5			2.2	3.0		4.2	1.9		6.6
61					1.5			2.2	3.0		3.8	1.9		0.5
60					1.5			2.2	3.0		3.6	2.1		0.5
59					1.5			2.2	3.1	-1.4	3.6	2.3		0.4
58					1.5				3.3	-18.9		2.3		0.5
57									3.3	1.7		2.3		13.5
56										1.4				0.5
55										1.3			2.3	3.6
54										2.0			2.0	0.5
53													1.9	1.2
52													1.5	0.8
51													1.5	13.4
50													1.5	0.6
49													1.5	4.6
48													1.5	2.3
47													1.5	1.2
46													1.5	0.8
45													1.5	6.4
44													1.5	0.3
43													1.5	0.2
42													3.2	0.3
41													5.0	11.3
40														

FIGURE 4 S-time-step (in years) as an additional measure of dynamics of life expectancy, how many years were needed to reach the next level of the indicator

SOURCE: Own calculations based on data from Figure 2.

The S-time-step measure is very easy to understand, for 1 year of increase of life expectancy in the last years at the very high level in Sweden about 5.5 years were needed, for India and Bangladesh about 3 years were needed for 1 year of increase in life expectancy at much lower level. This is a complementary description of the dynamics of life expectancy to the conventional growth rate matrix, which would describe in percentages per year. Both measures are valid description of the dynamics of change. For general public it might be even easier to understand that in the current past for one year of increase in life expectancy about 5.5 years in Sweden and about 3 years for India and Bangladesh were needed.

Different perception of inequality based on percentage and time distance measures

We have used life expectancy as the indicator to demonstrate that there are different possible statistical measures that can be used to describe the magnitude of inequalities in the world, which may produce vary different perceptions of that magnitude. Below we are showing the comparison of the results for inequality in life expectancy using three descriptive statistical measures: absolute difference, percentage difference, and S-time-distance for life expectancy indicator.

Comparison	Absolute difference	Percentage difference	S-time-distance (years)
Sweden - China	7.9	9.7%	48
Sweden - Lithuania	9.1	11.2%	55
Sweden - Niger	26.5	32.5%	107
Sweden - United Arab Emirates (Q3)	4.9	6.0%	29
Sweden - Iran (Median)	8.4	10.3%	52
Sweden - Sao Tome & Principe (Q1)	16.7	20.5%	75

TABLE 1 The perception of the magnitude of the differences in life expectancy may differ depending on the measure used
SOURCE: Own calculations based on data from UNDP (2013b), for Sweden before 1980 Mitchell (2003).

Similar to the example in Figure 1 the cases in this table indicate that perceptions of the size of this gap can be very different depending on the statistical measure used. The static difference against Sweden was less than 10 percent for China and 11 percent for Lithuania (which may appear to be small), while the S-time-distance was around 51 and 55 years, respectively (which gives a very different perception of the magnitude of the gap). The earlier comments showed how the time distance for the case for Niger behind Sweden was beyond 100 years, i.e. about twice of the above two countries.

Figure 5 illustrates differences between static and dynamic disparities for in the case of three variables (indicators) characterised by different growth rates. Type I processes (like live expectancy) are characterised by low relative static disparities, low growth rates and large time distances. In

contrast, Type III processes (like ICT indicator fixed broadband subscribers) are characterised by high static disparities expressed in percentage terms, and small time distances due to high growth rates.

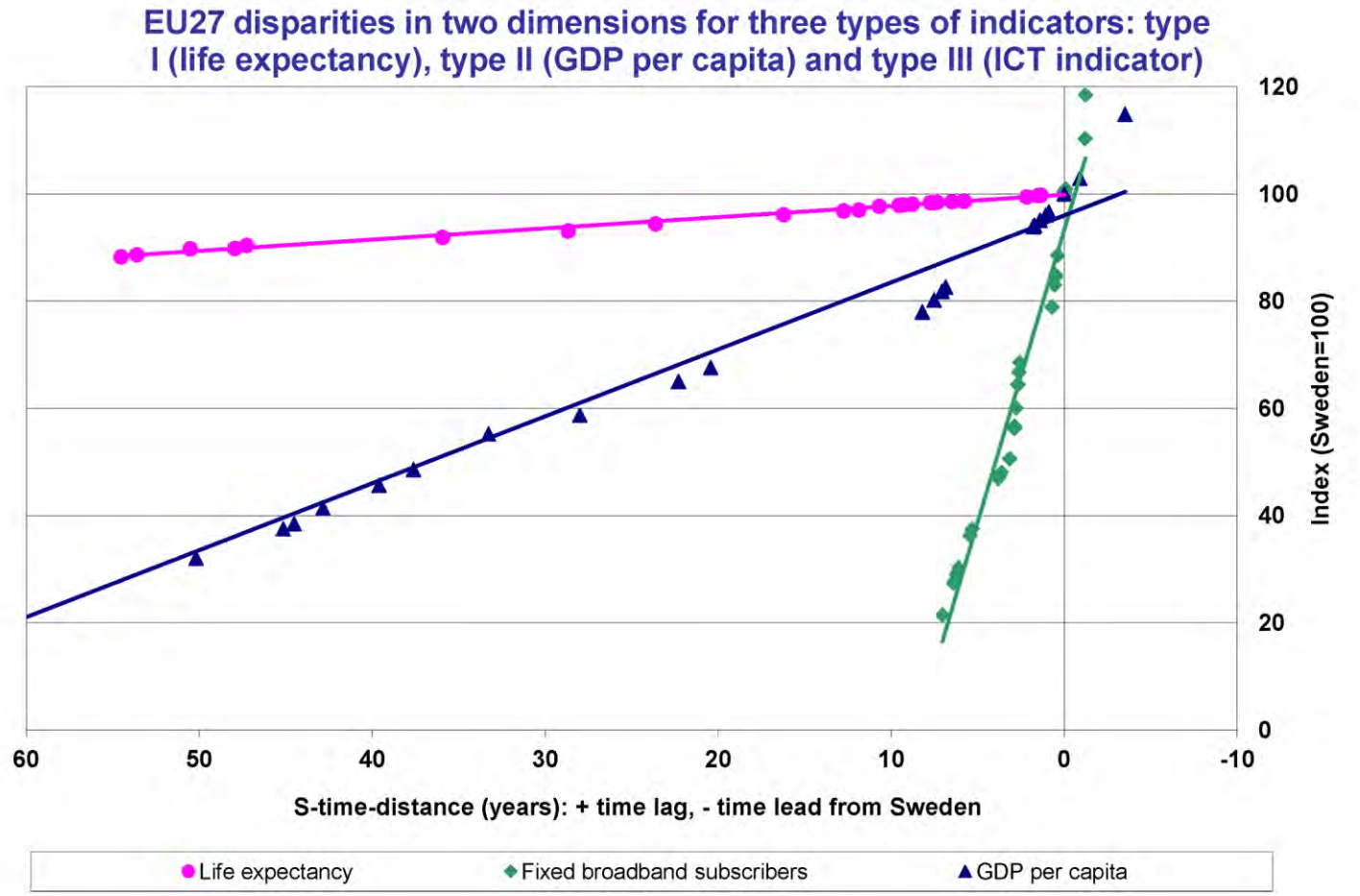


FIGURE 5 Differences between static and dynamic disparities against the benchmark Sweden for the case of three variables characterised by different growth rates
Source: Sicherl (2011a), p.28.

In Figure 6 life expectancy at the 2012 level for 194 countries were compared with the long-term time series for Sweden, providing an easy visualisation of disparities in life expectancy in the two dimensions. On the horizontal axes S-time-distances from the long-term trend for Sweden as the benchmark are shown (+ sign shown time lag behind Sweden and – sign time lead against Sweden). On the vertical axes static indices for 2012 are shown (Sweden in 2012=100), together with absolute levels of the indicator in brackets.

From these calculations the three measures of disparity for the upper quartile Q3, for the median and for the lower quartile Q1 were entered in the lower part of the Table 1. For static percentage difference Sweden life expectancy was higher for 6%, 10.3% and 20.5%, respectively, while S-time-distance lags behind Sweden were estimated at 29 years, 52 years and 75 years.

Again, the time lags behind Sweden are large and show that S-time-distance measure provides a very different perception that the relative static differences in percentages. At the country level we can see that for 28 countries the S-time-distance at their current levels of life expectancy behind long-term trend of Sweden amounted to more than 100 years.

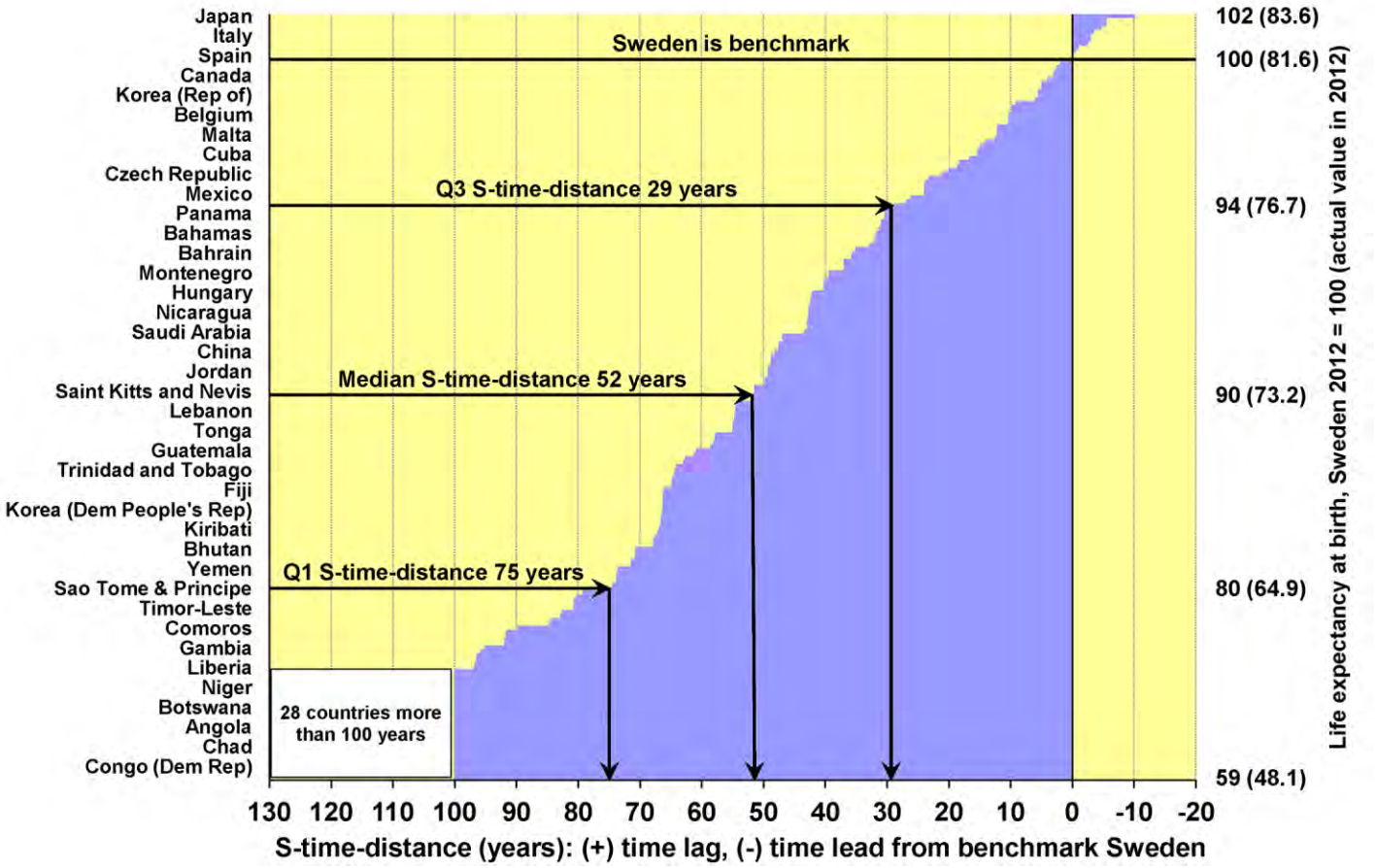


FIGURE 6 S-Time-Distance Showing How Many Years Earlier the 2012 Level of Life Expectancy at Birth of a Given Country was Attained in Sweden
SOURCE: Own calculations based on data from UNDP (2013b).

Gender disparities in life expectancy

This section provides further illustration of the use of two-dimensional analysis of disparity, here at an example of gender disparities. A separate study "How Much Longer Live Women than Men Around the Globe?, Astonishing Differences Between Countries" (Sicherl, 2014c) discusses gender differences in life expectancy in much greater detail.

Using UN data for life expectancy for a period of about 60 years Figure 7 presents S-time-matrix for the world, five world regions and China in three columns: time arrived for a given level of life expectancy for females, males and S-time-distances between them for a given level of the life expectancy.

The level-time matrix presents vivid visualisation of the situation across gender within a region and at the same time of position of levels across regions, much more clear and understandable if shown in original statistical tables (before transformation into S-time-matrix).

	WORLD			Australia/ New Zealand			Western Europe			Northern America			Latin America and the Caribbean			China			Africa		
Level of life expectancy at birth (years)	Females	Males	S-time-distance	Females	Males	S-time-distance	Females	Males	S-time-distance	Females	Males	S-time-distance	Females	Males	S-time-distance	Females	Males	S-time-distance	Females	Males	S-time-distance
84				2010																	
83				2004			2008														
82				2000			2003														
81				1996			1998			2009											
80				1991	2012	21	1993			2003											
79				1987	2007	20	1988			1991											
78				1981	2003	22	1984	2011	27	1982			2013								
77				1978	2001	23	1980	2006	26	1977			2009								
76				1975	1998	23	1976	2003	27	1974	2008	34	2005			2009					
75				1972	1995	23	1972	2000	28	1971	2004	32	2001			2004					
74				1960	1991	31	1966	1997	30	1966	1999	34	1997			2001	2012	11			
73				1955	1988	33	1961	1993	32	1958	1995	37	1994			1998	2006	7			
72	2011			1952	1984	33	1958	1988	31	1954	1990	37	1991			1995	2003	8			
71	2008				1981		1955	1984	29	1950	1984	33	1989	2011	22	1990	2001	11			
70	2004				1978		1952	1980	28		1979		1986	2007	21	1985	1999	13			
69	2001				1975			1976			1976		1984	2003	19	1981	1996	15			
68	1998				1970			1969			1973		1982	1999	18	1977	1990	13			
67	1992	2009	18		1953			1960			1968		1980	1996	17	1974	1986	12			
66	1987	2006	19					1955			1953		1978	1993	16	1972	1982	9			
65	1983	2003	19					1952					1976	1991	15	1971	1978	7			
64	1981	2000	19										1974	1988	14	1970	1975	4			
63	1978	1996	18										1971	1985	13	1970	1971	1			
62	1975	1989	13										1969	1982	13	1969	1970	1			
61	1973	1985	12										1967	1979	12	1969	1969	1			
60	1971	1982	11										1965	1976	11	1968	1969	1			
59	1969	1979	10										1963	1973	11	1968	1968	0	2011		
58	1968	1976	8										1961	1971	10	1967	1968	0	2010		
57	1967	1972	5										1959	1968	9	1967	1967	0	2008	2013	5
56	1966	1969	4										1957	1965	8	1966	1967	1	2007	2011	4
55	1965	1968	3										1955	1963	7	1966	1967	1	2005	2009	4
54	1963	1967	3										1954	1960	7	1966	1966	1	2002	2007	4
53	1962	1966	4										1952	1958	6	1965	1966	1	1985	2005	20
52	1961	1965	4										1951	1957	6	1965	1966	1	1982	2003	21
51	1959	1964	5											1955		1964	1965	1	1979	1999	19
50	1956	1963	7											1953		1964	1965	1	1977	1986	9
49	1954	1961	7											1951		1963	1965	1	1975	1982	8
48	1953	1958	5													1963	1964	1	1973	1980	7
47	1951	1954	3													1962	1964	2	1970	1977	7
46		1952														1961	1964	2	1968	1975	7
45		1951														1959	1963	4	1966	1972	7
44																1951	1963	12	1963	1970	7
43																	1962		1961	1968	6
42																	1961		1959	1965	6
41																			1957	1963	5
40																			1955	1960	5
39																			1953	1958	5
38																			1951	1956	5
37																				1954	
36																				1952	

Legend: Females Males S-time-distance (in years): Time lag of males behind females

FIGURE 7 Time matrix for selected units: female life expectancy, male life expectancy, S-time-distances between them for a given level of the life expectancy

SOURCE: Sicherl (2014c), p. 22 (Own calculations based on UN (2013b)).

For instance, for the highest level of female life expectancy of 72 years, the same level was achieved

in Australia/New Zealand in 1952, showing S-time-distance of 59 years for females (2011 – 1952), and at the level of male life expectancy of 67 years the time lag was 56 years (2009 – 1953) for males.

S-time-distance for the world average, i.e. the horizontal gap between trends of female and male life expectancy amounted to 20 years. This means that the male life expectancy in the 2005–2010 period was achieved by females already in the period 1985–1990. S-time-distance between levels of male life expectancy in 2008 and the trends of female values was 28 years for the EU27 and 35 years for the USA. The low growth rate of life expectancy indicates that this gender disparity will be very difficult to eliminate.

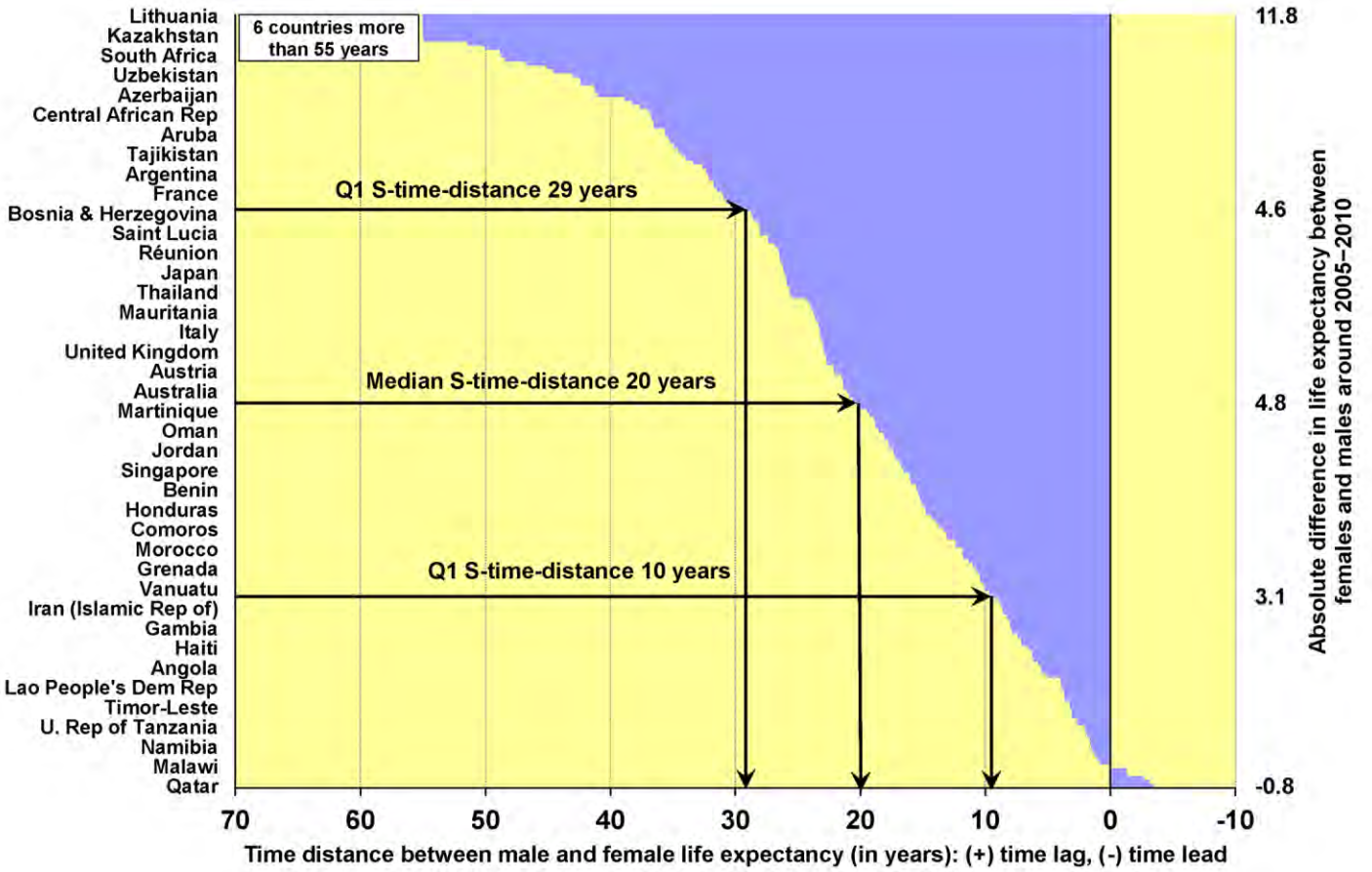


FIGURE 8 Time distance between male and female life expectancy at birth around 2005–2010 for 196 countries

SOURCE: Sicherl (2014c), p. 27 (Own calculations based on data from UN (2011)).

One of the main points in Sicherl (2014c) the astonishing differences between countries for gender inequality in life expectancy are shown by comparing the respective world ranks. There are two groups of about 20 countries each, which show great differences in the ranks (these differences range from 20 to 50 ranks in both directions) for females and males in the respective standings in the world. In one group the life expectancy for females ranks much better than that of males, in the other group males rank much higher than females. If one would rank countries in life expectancy only by total life expectancy these important differences would be suppressed.

Table 2 from Sicherl (2014c) summarise the results for period of about 60 years in the past as well as illustrates estimates for 2098 from UN (2011) to show the situation for two statistical measures: S-

time-distance in life expectancy for females and males. These results in Table 2 are related to time rather than to the levels of the indicator as in Figure 7.

Time	World	MDR	USA	EU27	LDR	China	India
1953							
1958					2.6		-3.0
1963	8.5				5.6		-2.7
1968	2.9				1.1	0.1	-2.2
1973	6.3				3.8	2.3	-1.8
1978	8.3				4.9	6.0	-0.4
1983	11.1	28.6			7.2	9.7	0.1
1988	12.6	31.2			8.5	11.2	0.5
1993	16.0	36.4			10.9	12.9	3.1
1994				34.0			
1995				34.0			
1996			36.0	33.0			
1997			33.3	32.5			
1998	18.7	39.8	33.0	33.5	13.3	14.8	4.1
2003	20.2	42.3	33.7	31.0	14.4	16.9	5.5
2008	20.2	41.5	34.7	28.0	13.3	17.2	7.1
2098	*42.8*	*50.3*			*40.2*	*39.8*	*36.4*

TABLE 2 S-time-distance (in years): Time lag for males behind females life expectancy for a given level of males

SOURCE: Sicherl (2014c), p. 21 (Own calculations based on data from UN (2011); for EU27 Eurostat (2012); for USA OECD (2012)).

The major conclusion of the above mentioned study (Sicherl 2014c) is that the statistical analysis clearly established significant differences in life expectancy at birth between genders, on the one hand, and striking differences between countries and regions, on the other. The reasons for such great dispersions of the analysed indicators are multifaceted and varied, they are important for explaining the present situation in individual countries and groups of countries.

Application for regional level within a country: County levels USA and NUTS2 EU levels

Institute for Health Metrics and Evaluation (IHME), University of Washington, Seattle, USA prepared a detailed analysis of life expectancy by gender for more than 3000 USA counties in the study "Falling behind: life expectancy in US counties from 2000 to 2007 in an international context" (Kulkarni et al., 2011).

Data presented in the web appendix of that study enabled us to look also at the female-male disparity in life expectancy similar to those in other sections of this report. In Sicherl 2014c, p. 29 it is shown that the median value for 3118 USA counties for female-male disparity in 2007 was 5.5 years, which is the same than the median value for NUTS2 regions for 2010, slightly less than for EU27 countries, and more than the median value for 196 world countries. Calculation for 2007 showed that in all of 3118 USA counties female life expectancy was higher than that of male life expectancy.

Methodological conclusions

It was shown how two additional descriptive statistical measures, S-time-distance and S-time-step, can usefully complement the conventional mostly static framework. As indicated earlier we used the indicator life expectancy at birth in this predominant methodological chapter for two reasons. Table 1 has shown that the perception of the magnitude of the differences in life expectancy may differ depending on the measure used; static inequalities seemed to give smaller and time distances larger perceptions of the degree of inequality. Besides the fact that the analysis provided new insights of the world situation in inequalities in life expectancy in the dynamic framework, these examples also indicate the methodology that will be used in analysing world disparities in many other economic, social, and environmental indicators.

It is also interesting to underline that S-time-distance in the UNDP analysis for health index is based on the transformation of the differences in levels of life expectancy in the index format, which means that the time distances calculated for absolute levels of life expectancy will stay the same for the health index between respective units, as it is the methodological characteristics of S-time-distance measure that linear transformations of time series will leave S-time-distances unchanged.

When considering time distances that include both past realisations and future projections, it is important to distinguish between backward looking (ex post) and forward looking (ex ante) S-time-distances; while the first type of measure belongs to the domain of descriptive statistics based on known facts, the second type may allow describing the results of scenarios and alternative policies in the future. While the time distance approach is not a forecasting tool, it provides a very useful innovative presentation of complex data sets.

Further information on the time distance methodology and applications are available in numerous earlier publications like Kyklos (Sicherl, 1973), IB Revija (Sicherl, 1999), Social Indicators Research (Sicherl, 2007), in the paper published by OECD Statistics Directorate (Sicherl, 2011a), and most extensively in the book ‘Time Distance in Economics and Statistics’ (Sicherl, 2012). More information is available in Appendix A1.

Chapter 3

S-TIME-MATRIX VISUALISATION AS A WAY OF PRESENTING DATA ACROSS MANY UNITS AND YEARS

Conventional table formats and possible additional time dimension complementary formats

In Chapter 2 we have already used in the examples on life expectancy the format of S-time-matrix to present data and the corresponding calculations of S-time-distance and S-time-step calculations. Let us here summarise the salient characteristics of S-time-distance methodology that were presented and illustrated on the examples of disparities and dynamics of life expectance indicator.

Sicherl (2011a, p. 9) explains in Table 1 the correspondence between the conventional table-format for time series data, and the complementary presentation based on the time distance approach. It refers to three types of comparisons: the level of the indicators, their dynamics, and comparisons of levels relative to a benchmark.

This schematic presentation shows the correspondence between conventional table format as the starting point in the databases and possible additional complementary presentations by time distance approach. The intention is to complement rather than replace the existing mostly static measures to provide a broader dynamic analytical framework.

One of these methodological possibilities is time matrix visualisation over many units and over time. Thus the first complementary presentation B1 refers to the initial data for indicators. For presentation of levels the conventional table-format for time series data A1 is transformed into time matrix, which has a table-graph format. The identifiers in level-time matrix are units and selected levels of indicator while the corresponding times are in the main body of the table. Calculating these times by interpolations may pose a small problem of the degree of accuracy compared to original data but it gains additional understanding about time dimension of disparities and a good summary overview.

In the time matrix data are arranged by selected levels of indicators showing in which year these levels of the indicators were achieved by given country. This format of level-time matrix is easily understood by everybody, at the same time it provides also a simple visualisation tool for many units over time.

This allows for a quick level comparison:

- of the situation of levels across the selected countries,
- of how many steps over levels of indicators a given country has progressed, which is an additional indication of the dynamics in the country.

The use of S-time-matrix presentation to complement the usual time series data tables covering many years and units shows that time matrix condenses such information in much smaller number of entries, which is of great advantage for presentation over many units and over time.

PRESENTATION OVER MANY UNITS AND OVER TIME

(LONG-TERM)

A. Conventional table format as the base

B. Possible additional complementary presentation

1. DATA FOR INDICATORS (example: life expectancy)

Table

A1	Time				
	1960	**…**	**…**	**…**	**2011**
Countries (units)	Indicator values at specific point in time				

Level-time matrix or table-graph

B1	Indicator value				
	66	**…**	**…**	**…**	**85**
Countries (units)	Time when the selected indicator value was achieved				

2. DYNAMICS AND COMPARISON OF DYNAMICS

Table of growth rates or indices of dynamics

A2	Time				
	1961	**…**	**…**	**…**	**2011**
Countries (units)	Annual growth rate or index of dynamics				

S-time-step (in years)

B2	Indicator value				
	67	**…**	**…**	**…**	**85**
Countries (units)	Time needed to achieve next level of the selected indicator value				

3. COMPARISON OF LEVELS

Index: benchmark = 100 by years

A3	Time				
	1960	**…**	**…**	**…**	**2011**
Countries (units)	Index values by years				

S-time-distance (in years) from benchmark

B3	Indicator value				
	66	**…**	**…**	**…**	**85**
Countries (units)	S-time-distance (in years): - time lead, + time lag from benchmark				

TABLE 3 Schematic presentation of correspondence between conventional table format and additional complementary presentation in time distance approach

Source: Sicherl (2011 and 2012).

The example for the starting base is the conventional statistical table A1 of the time series for life expectancy at birth by Eurostat for the period 1990 – 2012 presented in Table 4. It contains the absolute values of the indicator from which further statistical measures can be derived. We can mention two types of derived tables that are very frequently used in statistical publications. Table A2 transforms

original data in Table 4 into table of growth rates or indices of dynamics; Table A3 into indices or percentage differences from a benchmark. These are standard procedures that transform information from the initial database into derived supplementary tables. Yet these procedures can be extended into time distance presentation formats. Here we present side by side such complementary presentation formats.

Namely, the present state-of-the-art is not fully exploiting the information content that is available in existing data with respect to certain elements of the time dimensions involved. As explained earlier with the two-dimensional exploration of disparities, three possible similar derived additional complementary presentations can be presented from the same initial database table A1: B1 Level-time S-time-matrix (STM), B2 S-time-step (in years) and B3 S-time-distance (in years) from benchmark. In the broader dynamic framework it is clear that the conventional table presentations A1, A2 and A3 can in general have three counterpart tables B1, B2, and B3 to add the time distance dimension. In other words, instead of three tables one can have options of six tables presenting and describing the reality.

Life expectancy at birth	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium	76.2	76.3	76.5	76.5	76.8	77	77.3	77.5	77.6	77.7	77.9	78.1	78.2	78.3	79	79.1	79.5	79.9	79.8	80.1	80.3	80.7	80.5
Bulgaria	71.2	71.1	71.2	71.2	70.9	71	70.8	70.3	70.9	71.6	71.6	71.9	72.1	72.3	72.5	72.5	72.7	73	73.3	73.7	73.8	74.2	74.4
Czech Republic	71.5	72	72.4	72.9	73.2	73.3	74	74.1	74.7	74.9	75.1	75.3	75.4	75.3	75.9	76.1	76.7	77	77.3	77.4	77.7	78	78.1
Denmark	74.9	75.3	75.3	75.2	75.5	75.3	75.7	76.1	76.5	76.6	76.9	77	77.1	77.4	77.8	78.3	78.4	78.4	78.8	79	79.3	79.9	80.2
Germany	75.4	75.7	76.2	76.2	76.6	76.7	77	77.4	77.8	78	78.3	78.6	78.6	78.6	79.3	79.4	79.9	80.1	80.2	80.3	80.5	80.8	81
Estonia	69.9	69.8	69.1	68.1	66.6	67.7	69.9	70.1	69.7	70.6	71.1	70.9	71.4	71.9	72.4	73	73.2	73.2	74.4	75.3	76	76.6	76.7
Ireland	74.8	75	75.4	75.3	75.8	75.5	75.8	76	76.2	76.1	76.6	77.2	77.7	78.2	78.6	79	79.3	79.7	80.2	80.2	80.8	80.9	80.9
Greece	77.1	77.1	77	77.4	77.5	77.5	77.6	77.9	77.9	77.9	78.2	78.8	79	79.1	79.3	79.5	79.8	79.7	80.2	80.4	80.6	80.8	80.7
Spain	77	77.1	77.6	77.7	78.1	78.1	78.2	78.7	78.8	78.8	79.3	79.8	79.8	79.7	80.4	80.3	81.1	81.1	81.5	81.9	82.4	82.6	82.5
France	77	77.2	77.5	77.5	78	78.1	78.2	78.6	78.8	78.9	79.2	79.3	79.4	79.3	80.4	80.4	81	81.3	81.4	81.6	81.9	82.3	82.1
Croatia												74.6	74.7	74.6	75.4	75.3	75.9	75.8	76	76.3	76.7	77.2	77.3
Italy	77.1	77.1	77.5	77.8	78	78.3	78.7	79	79.1	79.6	79.9	80.3	80.4	80.1	80.9	80.9	81.4	81.6	81.7	81.8	82.2	82.4	82.4
Cyprus				77.2	77.1	77.4	77.7	77.4	77.2	78	77.7	79	78.7	79	79.1	78.7	80.1	79.8	80.6	81	81.5	81.2	81.1
Latvia													70.2	70.6	70.9	70.6	70.6	70.8	72.1	72.8	73.1	73.9	74.1
Lithuania	71.5	70.6	70.5	69	68.6	69.1	70.3	71.1	71.4	71.8	72.1	71.6	71.8	72	72	71.2	71	70.7	71.7	72.9	73.3	73.7	74.1
Luxembourg	75.7	75.7	75.3	76	76.7	76.8	76.8	77.1	77.3	78	78	78	78.1	77.9	79.2	79.6	79.4	79.5	80.7	80.8	80.8	81.1	81.5
Hungary	69.4	69.4	69.2	69.2	69.6	70	70.6	71.1	71	71.1	71.9	72.5	72.6	72.6	73	73	73.5	73.6	74.2	74.4	74.7	75.1	75.3
Malta						77.2	77.3	77.6	77.5	77.4	78.4	78.9	78.8	78.7	79.4	79.4	79.5	79.9	79.7	80.4	81.5	80.9	80.9
Netherlands	77.1	77.2	77.4	77.1	77.6	77.6	77.6	78	78.1	78	78.2	78.4	78.5	78.7	79.3	79.6	80	80.4	80.5	80.9	81	81.3	81.2
Austria	75.8	75.9	76.1	76.3	76.7	76.9	77.1	77.5	77.9	78.1	78.3	78.8	78.9	78.8	79.3	79.5	80.1	80.4	80.6	80.5	80.8	81.2	81.1
Poland	70.7	70.4	71	71.5	71.8	72	72.3	72.7	73.1	73.1	73.8	74.2	74.5	74.7	74.9	75	75.3	75.4	75.6	75.9	76.4	76.9	76.9
Portugal	74.1	74.1	74.7	74.6	75.5	75.4	75.3	75.8	76	76.2	76.8	77.2	77.4	77.5	78.4	78.2	79	79.3	79.5	79.7	80.1	80.7	80.6
Romania	69.9	70.1	69.5	69.5	69.4	69.3	68.8	69.1	69.9	70.6	71.2	71.1	71	71.4	71.9	72.3	72.8	73.3	73.5	73.6	73.8	74.6	74.5
Slovenia	73.9	73.6	73.7	73.6	74	74.7	75.2	75.2	75.3	75.7	76.2	76.4	76.6	76.4	77.2	77.5	78.3	78.4	79.1	79.4	79.8	80.1	80.3
Slovakia	71.1	71.1	71.5	72	72.5	72.4	72.9	72.9	72.8	73.2	73.3	73.6	73.8	73.8	74.2	74.1	74.5	74.6	74.9	75.3	75.6	76.1	76.3
Finland	75.1	75.5	75.7	75.9	76.7	76.7	77	77.2	77.4	77.6	77.8	78.2	78.3	78.6	79	79.1	79.5	79.6	79.9	80.1	80.2	80.6	80.7
Sweden	77.7	77.8	78.2	78.2	78.9	79	79.2	79.4	79.5	79.6	79.8	79.9	80	80.3	80.7	80.7	81	81.1	81.3	81.5	81.6	81.9	81.8
United Kingdom				76.2	76.8	76.7	77	77.2	77.4	77.5	78	78.2	78.3	78.4	79	79.2	79.5	79.7	79.8	80.4	80.6	81	81

TABLE 4 Life expectancy at birth

Source: Eurostat (2013a), Life expectancy by age and sex, Total [demo_mlexpec].

Original data in Table 4 are transformed into S-time-matrix in Figure 9; here we present them side by side as complementary presentation formats A1 and B1. Data in STM are arranged by selected levels of indicators, for life expectancy from 67 years to 82 years on the horizontal axes; in the body of the STM it shown in which year these levels of the indicator were achieved by given country. The year

presented in **bold** shows the latest presented year of the indicator for the given country. It can help to quickly observe whether there was a noticeable decrease in later years in the observed period.

Time matrix for life expectancy at birth

LEVEL	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
Spain											1990	1994	1999	2003	2006	**2009**
Italy												1994	1997	2000	2005	**2010**
France											1990	1994	1999	2004	2006	**2010**
Sweden												1992	1995	2002	**2006**	
Cyprus												2000	2005	2007	**2009**	
Netherlands												1999	2004	2006	**2010**	
Austria										1992	1996	1999	2003	2006	**2011**	
Luxembourg										1993	1997	2003	2004	2007	**2011**	
Malta												2000	2003	2008	**2011**	
United Kingdom											1996	2000	2004	2008	**2012**	
Germany										1992	1996	1999	2004	2007	**2012**	
Greece											1992	1999	2002	**2008**		
Ireland									1991	1997	2001	2003	2005	**2008**		
Finland										1993	1996	2001	2004	**2009**		
Belgium											1995	2001	2004	**2009**		
Portugal									1993	1998	2001	2004	2006	**2010**		
Slovenia								1994	1996	2000	2004	2006	2008	**2011**		
Denmark									1990	1997	2001	2004	2009	**2011**		
Czech Republic						1991	1993	1996	2000	2005	2007	**2011**				
Croatia									2004	2008	**2011**					
Poland					1992	1995	1998	2001	2005	**2009**						
Estonia	1994	1995	1996	1998	2001	2003	2005	2008	2009	**2010**						
Slovakia						1993	1999	2004	2008	**2011**						
Hungary				1995	1998	2000	2005	2008	**2011**							
Romania			1997	1998	2002	2004	2006	**2010**								
Bulgaria					1998	2002	2007	**2011**								
Latvia					2007	2008	2010	**2012**								
Lithuania			1995	1996	2007	2008	2009	**2012**								

FIGURE 9 S-time-matrix for life expectancy at birth for EU countries
Source: Own calculations based on Table 4.

Time matrix condenses information over many units and years (from about 550 entries in the input file in Table 4), into a much smaller number of about 140 entries, which is a great advantage for presentation and visualisation providing a good summary overview of the situation at a glance.

Table 4 is clearly very important as the starting point of many derived tables, yet it is very difficult to observe the overall picture very quickly. Therefore the S-time-matrix presentation format can complement it very usefully. At the first glance one can see that disparities in the EU for life expectancy are large: from about 82 years attained in Spain, Italy and France to level of 74 years in Romania, Bulgaria, Latvia and Lithuania. The fastest increase in the observed period was 9 steps in Estonia, but its level is still more than 22 years behind the three leading countries. There are very many comparisons that can be seen from the STM without going into software calculation of S-time-step and S-time-distance.

The user can set up the arrangement of levels in main axes presenting levels of the indicator in

question. In Figure 9 here the span of levels with step of one year can encompass all the levels of the EU countries for the observed period 1990 – 2012, so the STM can be presented in horizontal direction. As we have seen in Chapter 2 when the span of levels of the indicator are much larger that they would be able to spread them out horizontally in a single table. There are several possibilities to deal with this problem. In Figure 2 we set up the span of levels of life expectancy vertically, similarly for female and male levels in Figure 7. The other possibility is to make the difference in the levels specified in such a way that could the whole range fit into the size of the figure in one page horizontally. Or one could space the levels of the indicator differently at higher values and differently at lower levels like in Figures 16 and 17 in this chapter.

By itself (i.e. even without calculating the two statistical measures S-time-distance and S-time-step) such matrices can be used in publications, web pages, etc. as a first-level visualisation tool to 'turn statistics into knowledge' (Sicherl, 2011a, p. 30). There are several methods to calculate S-time-distance and S-time-step, yet one of the possible approximations is to calculate them from the S-time-matrix for given levels of the indicator specified there. The examples in Chapter 2 are Figure 3 and Figure 4, as well as Figure 7 for S-time-distance for gender disparity.

S-time-step in format B2 is an alternative expression of the dynamics complementing growth rates or indices of dynamics in format A2. Both have advantages and disadvantages, best is to use both. Comparison of levels in static format A3 (static index expressed as benchmark = 100 by years) can be complemented by format B3 with S-time-distance showing time lead or time lag from benchmark unit for the given level of the indicator.

The time distance methodology enables additional understanding of the information contained in the time series database. In addition to the existing statistical measures some of the relations in data can be analysed and described in time measures that help the stakeholders to form broader perception of the situation.

S-time-matrices for world regions for ten selected MDG indicators

In this section we present S-time-matrices for ten selected MDG indicators with the intent to show for the world regions, as they are defined in the MDG datasets in the statistical appendix of the MDG Report (UN 2014), the summary overview over the past analysed period covered in these appendices (mostly 1990 – 2013). If data would be systematically provided over longer period the methodology would easily deal with such data as shown in examples in Chapter 2.

Nevertheless, these figures can provide presentation format that can be useful in the debate of the starting point in setting up post-2015 Sustainable Development Goals (SDG). We shall not discuss the information provided in figures in details; they can be analysed by interested users from their point of interest. We are also not developing the two possible derived measures of S-time-distance and S-time-step, except in Figure 11 to indicate the possible conclusions that could be reached from such calculations. The presented S-time-matrices can already by themselves provide very useful initial input

in observing reality in the time perspective for the purpose of understanding the differences between the analysed units as the starting point of discussing the SDGs and the related targets for the post-2015 period.

Indicator level	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
World	1995	1999	2001	2003	2006	2008	2010	**2012**											
Developed regions		1995	1997	1998	1999	2000	2001	2002	2004	2005	2006	2007	2009	2010	2011	**2013**			
Least dev. countries	2002	**2009**																	
Developing regions	1997	2001	2004	2006	2009	**2011**													
Sweden	1991	1995	1996	1996	1997	1997	1998	1998	1999	2000	2001	2001	2001	2002	2002	2003	2003	2007	**2010**
Eastern Asia	1996	2000	2002	2003	2005	2006	2008	2009	2011	**2012**									
Latin America & Car.	1996	2000	2002	2003	2005	2006	2008	2009	2011	**2012**									
Northern Africa	2000	2001	2003	2005	2006	2008	2009	2011	**2013**										
Western Asia	1997	2001	2002	2004	2006	2007	2009	2011	**2013**										
Caucasus & Centr. Asia	2000	2001	2003	2005	2006	2008	2010	**2011**											
South-Eastern Asia	1997	2001	2004	2007	2009	**2012**													
Sub-Saharan Africa	2000	2004	2008	**2012**															
Southern Asia	2001	2005	**2010**																
Oceania	1998	2005	**2012**																
China	1999	2002	2006	2007	2008	2008	2009	2010	2011	**2013**									
India	2001	2009	2011	**2013**															

FIGURE 10 Internet users per 100 inhabitants for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Indicator level	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
World	4	4	5	7	9	11	12	14											
Developed regions		0	0	1	2	3	4	4	5	5	6	6	7	8	9	10			
Least dev. countries	11	15																	
Developing regions	7	6	8	10	12	14													
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eastern Asia	6	5	6	7	8	9	10	11	12	13									
Latin America & Car.	5	5	6	7	8	9	10	11	12	13									
Northern Africa	9	6	7	8	9	11	12	13	14										
Western Asia	6	6	6	8	9	10	11	13	14										
Caucasus & Centr. Asia	9	7	7	8	10	11	12	13											
South-Eastern Asia	6	6	8	10	13	15													
Sub-Saharan Africa	10	9	12	16															
Southern Asia	10	10	14																
Oceania	7	10	16																
China	9	7	10	10	11	11	12	12	13	13									
India	11	14	15	17															

FIGURE 11 S-time-distance in years as a time measure of the gap of countries from Sweden for a given level of the Internet users
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Only for the first selected indicator Internet users per 100 inhabitants we also use derivation of S-time-distance in Figure 11, derived from the STM Figure 10. The important point is that Internet has been growing so fast that even large static disparities show rather short S-time-distances as distinct from the situation with the indicator of life expectancy in Chapter 2. Internet penetration in Sweden has grown from about 1% in 1991 to about 90% in 2010, making it a suitable benchmark to cover the whole range. At the latest values the penetration percentage in Sweden is about twice of that in China, yet at that level was Sweden only 13 years ago. The very high growth rates for many ICT indicators indicate, that especially for less demanding applications, ICT can be one of the areas where disparities in the world could be lessened in the time distance perspective.

Indicator level	62	59	56	53	50	47	44	41	38	35	32	29	26	23	20	17	14	11	8	5	2
Least dev. countries	1999	2001	2003	2005	2007	**2009**															
Developing regions						1991	1993	1995	1998	2000	2002	2004	2006	2009	**2011**						
Northern Africa																				1990	**2008**
Western Asia																				1997	**2011**
Caucasus & Centr. Asia																2000	2002	2003	2005	**2008**	
Latin America & Car.																		1999	2004	**2011**	
Eastern Asia		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2007	2010	**2011**		
Oceania				1991	1992	1993	1994	1996	1997	2010	2010	2010	2010	2010	2011	2011	2011	2011	**2011**		
South-Eastern Asia							1992	1995	1997	1999	2000	2001	2002	2003	2005	2007	**2010**				
Southern Asia					1992	1995	1998	2001	2005	2007	2009	2010	**2011**								
Sub-Saharan Africa		1999	2002	2005	2008	**2011**															
China		1991	1992	1993	1994	1994	1995	1995	1996	1999	2001	2002	2003	2003	2004	2005	2007	2009	**2010**		
India						1996	2001	2004	2006	2008	2009	2010	**2010**								

FIGURE 12 Proportion of population living below $1.25 purchasing power parity (PPP) per day (%) for world regions

SOURCE: Own calculations based on data from UN (2015b, 2015c).

Decrease in poverty as indicated by Proportion of population living below $1.25 purchasing power parity (PPP) per day (%) has shown important developments, though at different rate in the world regions. The best performer was China, decreasing the percentage from 59% to about 8%, a very large improvement in about a decade and one half. This contributed also to the results of region of Eastern Asia. Developing regions as a whole decreased it from about 47% to about 20%; Least developed countries from about 62% to 47%. By regions it means that from available data four regions (Sub-Saharan Africa, Oceania, India and Southern Asia are still having the share of population below that level higher than 26%, all other developing regions are at levels much lower. Such broad observations can be easily done from the STM approximations visually, while more precise percentages and dates could be estimated from the original database (probably with no substantially different conclusions).

These important decreases in the share of population below the poverty line will be confirmed in analysis of implementation of this MDG target in Chapter 4. In Gaptimer Progress Chart of MDG implementation for world regions, China and India in Figure 29 it shown that for Developing Regions the 2015 target of 50% reduction was already achieved in 2010, 5 years earlier (S-time-lead of 5 years).

Indicator level	51	49	47	45	43	41	39	37	35	33	31	29	27	25	23	21	19	17	15	13	11	9	7	5	3	1
World														1990	1994	1999	2003	2008	**2012**							
Developed regions																										**1990**
Eastern Asia																			1990	1994	1997	2001	2005	2008	**2012**	
Latin America & Car.																							1990	2001	**2012**	
Caucasus & Centr. Asia																						1990	2001	**2012**		
Northern Africa																						1994	2003	**2012**		
Western Asia																				1993	1998	2004	2009	**2014**		
South-Eastern Asia											1990	1993	1996	1999	2002	2005	2008	**2011**								
Oceania																	**2015**									
Sub-Saharan Africa												1990	1996	2001	2007	**2012**										
Southern Asia		1991	1993	1996	1998	2000	2002	2004	2007	2009	2011	**2014**														
China																				1993	1995	1996	2001	**2004**		
India	1993	1994	1994	**2002**	1998	1998	1997																			

FIGURE 13 Prevalence of underweight children under 5 years of age for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

For the indicator Prevalence of underweight children under 5 years of age the situation for world regions seems to be better than for percentage below the poverty line in Figure 12, the only clear exceptions are Southern Asia and India (if the UN data are correct). China and 5 regions have prevalence below 5%, South-Eastern Asia at about 17%, Oceania at 19% and Sub-Saharan Africa at about 21%.

Indicator level	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
World									1994	1997	2000	2001	2003	2004	2006	2009	**2012**								
Developed regions																						**2014**	2001		
Least dev. countries	2007	2007	2008	2009	2010	2011	2011	2012	2014	**2015**															
Developing regions						1991	1994	1996	1999	2001	2002	2003	2004	2006	2008	2011	**2015**								
Northern Africa							1991	1992	1993	1994	1995	1996	1997	1998	1999	2001	2002	2003	2004	2005	2007	2008	2009	2011	**2012**
Eastern Asia																						**2002**			
Oceania	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2012	2013	2013	2014	2014	**2015**				
Western Asia										1992	1996	2000	2001	2002	2004	2005	2007	2009	2011	2013	**2015**				
Southern Asia		1992	1994	1996	1998	2000	2000	2001	2001	2002	2002	2003	2003	2004	2004	2005	2006	2008	2010	**2011**					
Caucasus & Centr. Asia																					**2000**				
South-Eastern Asia																			2009	**2013**					
Latin America & Car.												1991	1992	1993	1994	1996	1997	1998	1999	**2009**					
Sub-Saharan Africa	2009	2010	2011	2012	**2014**																				

FIGURE 14 Net enrolment ratio in primary education for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Net enrolment ratio in primary education for world regions show improvements but in general not attaining the full coverage of appropriate age group. This target shows one of the largest time lags of being about 10 years behind the line to 2015 target in Gaptimer Progress Chart of MDG implementation.

Indicator level	0.80	0.81	0.82	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.90	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	1.00	1.01	1.02	1.03
World										1991	1994	1997	2000	2002	2005	2007	2010	2012	**2015**					
Developed regions																				2012	**2015**			
Least dev. countries	1991	1993	1995	1996	1998	2000	2002	2003	2005	2006	2008	2009	2011	2012	**2015**									
Developing regions								1991	1993	1996	1998	2000	2002	2004	2006	2008	2010	2012	**2015**					
Southern Asia	1996	1997	1998	1999	2000	2001	2002	2002	2003	2004	2005	2005	2006	2007	2008	2008	2009	2010	2011	2011	2012	2013	2014	**2015**
South-Eastern Asia																		2000	2006	2012	2014	**2015**		
Caucasus & Centr. Asia																				**2015**	1991			
Eastern Asia													1991	1992	1993	1994	1996	1997	1998	**2015**	2012			
Latin America & Car.																	2000	2012	**2015**					
Northern Africa			1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2002	2005	2007	2010	**2015**							
Western Asia						1991	2000	2002	2003	2005	2007	2009	2010	2012	**2015**									
Oceania											2000	2004	2008	**2012**										
Sub-Saharan Africa					1991	2000	2002	2003	2005	2007	2009	2010	2012	**2015**										
China											1990	1991	1992	1993	1994	1995	1995	1996	1997	1998	2012	**2013**		
India	1993	1995	1996	1998	2000	2001	2002	2002	2002	2002	2002	2002	2003	2003	2003	2003	2003	2003	2007	2007	2008	2010	2011	**2012**

FIGURE 15 Ratio of girls to boys in primary education for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Ratio of girls to boys in primary education for world regions has been improving considerably as one can see by long horizontal indication of many steps covered. For least developed countries the average reached 0.93, with 0.92 in Sub-Saharan Africa. However, one would need to see the ratio at the national level to identify the problems for the post-2015 period.

Indicator level	170	160	150	140	130	120	110	100	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10
World										1990	1994	1997	2000	2003	2005	2007	2009	2011	**2013**							
Developed regions																									1990	**2000**
Least dev. countries	1991	1994	1997	1999	2002	2004	2006	2009	2010	2011	2012	**2013**														
Developing regions								1990	1993	1996	1999	2001	2003	2005	2007	2009	2011	**2013**								
Eastern Asia																		1992	1995	1998	2001	2004	2006	2009	**2011**	
Latin America & Car.																		1992	1994	1996	1999	2002	2006	**2011**		
Northern Africa														1991	1993	1994	1996	1998	2000	2002	2005	2008	**2013**			
Western Asia															1990	1992	1995	1997	1999	2002	2005	2009	**2013**			
South-Eastern Asia														1990	1993	1995	1997	1999	2002	2005	2009	**2012**				
Caucasus & Centr. Asia														1993	1999	2002	2004	2006	2008	2010	**2013**					
Oceania														1996	2002	2007	**2012**									
Southern Asia						1992	1995	1998	1999	2001	2002	2004	2006	2008	2010	2011	**2013**									
Sub-Saharan Africa	1994	1998	2001	2003	2005	2007	2010	2012	**2013**																	
China																		1994	1996	1999	2001	2003	2005	2007	**2011**	
India						1992	1995	1998	1999	2000	2002	2003	2005	2007	2008	2010	**2012**									

FIGURE 16 Under-five mortality rate for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Under-5 mortality rate showed good improvements, especially in China, where it fell to 15 percent, at that level the time lag behind developed regions was only 21 years (2011 – 1990). For India, Oceania, Southern Asia it is still above 50 percent, for Sub-Saharan Africa even at about 95 percent.

Indicator level	990	900	800	700	600	500	400	350	300	250	200	150	140	130	120	110	100	90	80	70	60	50	40	30	20
World								1996	2003	**2009**															
Developed regions																									**1997**
Developing regions							1995	2002	2007	**2011**															
Eastern Asia																		1992	1995	1998	2001	2006	**2010**		
Caucasus & Centr. Asia																				1990	2003	2008	**2013**		
Northern Africa												1992	1994	1996	1998	2000	2003	2006	2010	**2013**					
Western Asia														1990	1993	1996	1999	2004	**2010**						
Latin America & Car.													1990	1993	1997	2000	2005	**2010**							
South-Eastern Asia									1992	1997	2003	2011	**2013**												
Oceania								1994	1999	2005	**2012**														
Southern Asia						1992	1998	2001	2005	2008	**2012**														
Sub-Saharan Africa	1990	1996	2001	2005	**2009**																				
China																		1992	1994	1997	2001	2005	**2009**		
India						1993	1998	2001	2004	2008	**2012**														

FIGURE 17 Maternal mortality ratio for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Maternal mortality ratio per 1,000 births for world regions is very high and is a clear target for SDG. India, Southern Asia, South-Eastern Asia, and especially Sub-Saharan Africa are influencing the average for Developing regions to stay at only 250. The other developing regions are at or below 90, with China and Caucasus & Central Asia reaching 40.

Indicator level	20	30	40	50	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94
World										2000	2001	2001	2002	2004	2005	2007	2009	**2012**				
Least dev. countries								1994	1995	1996	1997	1998	1999	2002	2005	2007	2010	**2012**				
Developing regions										2000	2001	2001	2002	2004	2005	2007	2009	**2010**				
Eastern Asia																			1994	1997	2002	**2012**
Northern Africa															1994	1996	2011	2012	**2012**			
South Asia				2001	2002	2002	2002	2003	2003	2004	2005	2006	2006	2007	2008	2008	2009	2010	**2012**			
South-Eastern Asia																1994	1997	2002	**2012**			
Caucasus & Centr. Asia												2011	2011	2011	2012	2012	**2012**					
Western Asia											1994	1996	1999	2002	2005	2008	**2011**					
Sub-Saharan Africa					1994	1995	1996	1997	1998	1999	2001	2003	2005	2007	2009	**2011**						
Oceania						1994	2002	2004	2006	2008	2010	**2012**	2000									
Latin America & Car.								1995	1996	1997	1998	**2012**	2012	2011	2005							
China																					2006	**2009**
India	1997	2000	2000	2001	2002	2002	2002	2002	2003	2003	2003	2003	2003	2003	2004	2004	2005	2005	**2012**			

FIGURE 18 Patients successfully treated under directly observed treatment short course (%) for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Patients successfully treated under directly observed treatment short course (%) indicate very large improvement in India from a very low level of success; China reaching even 96 percent.

Indicator level	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
World															1990	1993	1997	2000	2004	2007	2010	**2014**				
Developed regions																										**1990**
Developing regions												1990	1993	1995	1998	2000	2003	2006	2008	2011	**2014**					
Eastern Asia											1990	1992	1994	1996	1997	1999	2001	2003	2005	2007	2008	2010	2012	2014	**2015**	
Latin America & Car.																				1992	1997	2002	2007	**2012**		
Western Asia																				1994	2001	2008	2013	**2014**		
Northern Africa																					1994	2003	**2012**			
Southern Asia														1991	1994	1996	1999	2001	2003	2006	2008	2011	**2014**			
South-Eastern Asia													1990	1993	1995	1998	2000	2003	2006	2008	2011	**2015**				
Caucasus & Centr. Asia																				2012	**2014**					
Sub-Saharan Africa	1990	1993	1996	1998	2001	2004	2007	2009	2012	2014	**2015**															
Oceania		1990	1997	2005	**2015**																					
China											1991	1992	1994	1995	1997	1998	2000	2001	2003	2005	2007	2008	2012	2014	**2015**	
India													1991	1993	1995	1997	1999	2001	2003	2005	2008	2010	2014	**2015**		

FIGURE 19 Proportion of population using an improved drinking water source, total for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Proportion of population using an improved drinking water source has improved substantially, as it will be shown in Chapters 4 and 5 for monitoring implementation of MDGs. Very low values are for Sub-Saharan Africa and Oceania.

Indicator level	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96
World													1990	1997	2003	2010	**2014**										
Developed regions																											**2015**
Developing regions										1993	1998	2003	2007	2012	**2014**												
Caucasus & Centr. Asia																									1990	2003	**2015**
Western Asia																						1992	2000	2007	2013	**2014**	
Northern Africa																			1991	1994	1998	2001	2004	2008	**2014**		
Latin America & Car.																		1993	1997	2002	2006	**2011**					
Eastern Asia												1991	1995	1999	2003	2007	2011	2013	2014	**2014**							
South-Eastern Asia											1990	1993	1996	1999	2001	2004	2007	2010	**2015**								
Southern Asia			1992	1996	1999	2002	2005	2009	2012	**2014**																	
Oceania						**1990**																					
Sub-Saharan Africa			1990	2001	**2015**																						
China											1990	1993	1996	1998	2001	2004	2006	2009	2012	**2015**							
India	1992	1995	1998	2001	2004	2007	2010	**2015**																			

FIGURE 20 Proportion of population using an improved sanitation facility, total for world regions
SOURCE: Own calculations based on data from UN (2015b, 2015c).

Although the range of levels for the two indicators are not the same, one can at a glance observe that the situation with respect to proportion of population using an improved drinking water source in Figure 19 shows considerably better situation than the indicator proportion of population using an improved sanitation facility. India, Oceania, and Sub-Saharan Africa show much lower values than the average for Developing regions, which value at about 60 percent is much lower than the corresponding

value for improved drinking water resources at 88 percent (for India 39 percent against 94 percent).

S-time-matrices comparing countries

For debating and setting up the SDGs at the national level it is advisable to calculate S-time-matrices for various indicators at the country level for these and other indicators that will come into consideration.

Here we present only two examples to indicate how such S-time-matrix would look at the country level within a world region. The first example is Figure 20 showing S-time-matrix for Under-five mortality rate for countries in Sub-Saharan Africa. It clearly shows vast differences between countries within region. The average value for the region is about 95, but there are 15 countries with values higher than that indicating worse situation in this domain. So the starting values for countries for the post-2015 period will be very different and this will have to be taken into account if the targets will be defined realistically.

The first precondition for calculating such matrix is naturally good statistical data over a longer period of time. We use here official UN data from the MDG database to show how it would look like and thus also present information in the format useful as starting point for post-2015 discussion. We enable interested users at national and international organisations to complement existing methods with the time distance methodology in two ways. Firstly, in this study and in other previous studies we provide the broadened time distance methodology: S-time-matrix, and two additional statistical measures S-time-distance and S-time-step. Secondly, we also provide computer software Time Matrix Calculator to calculate time matrix for your own data. This was developed by Faculty of Social Sciences, University of Ljubljana and SICENTER, Ljubljana, Slovenia and is available on www.timedistance.net.

The two examples of S-time-matrices for country level are examples how they could be used by regional organisations to show the situation across the region or by countries themselves that they would select only those countries of their interest, either from their region or from other regions with interesting policies.

In the second example of Internet users per 100 inhabitants for Latin America and Caribbean countries the average values for the region was 45 per 100 inhabitants, and 21 countries were lower than that. From such S-time-matrix one could calculate S-time-distances from chosen benchmarks or S-time-step between the next set levels of the indicator from these matrix. If the values of the level span would be changed, this can be done in specifying the levels in the Time Matrix Calculator (see Appendix A2) and experiment with various options.

LEVEL	300	250	200	150	100	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15
World							1990	1993	1997	2000	2002	2004	2007	2009	**2011**							
Least dev. countries				1996	2009	2010	2011	**2012**														
Developing regions					1990	1993	1996	1999	2001	2003	2005	2007	2009	2011	**2013**							
Sub-Saharan Africa				2001	2012	**2013**																
Seychelles																						**1993**
Mauritius																					1999	**2011**
Cape Verde													1993	1995	1997	1998	1999	2000	**2002**			
South Africa									2005	2006	2008	2009	2009	2010	2011	**2012**						
Botswana								2002	2003	2004	2004	2005	2006	2009	**2011**							
Congo					2004	2005	2006	2006	2007	2008	2008	2009	2010	2011	**2013**							
Namibia										2004	2006	2007	2009	2010	**2013**							
Eritrea				1990	1998	1999	2000	2001	2002	2004	2005	2007	2008	2010	**2013**							
Sao Tome & Principe					1997	1998	2000	2001	2002	2004	2005	2007	2009	**2011**								
United Rep of Tanzania				1997	2004	2004	2005	2006	2007	2007	2008	2009	2010	**2012**								
Rwanda		1995	1999	2002	2006	2006	2006	2007	2008	2008	2009	2010	2011	**2012**								
Senegal					2005	2005	2006	2007	2008	2008	2009	2010	**2012**									
Madagascar				1992	2002	2003	2004	2004	2005	2007	2008	2009	**2011**									
Gabon							1993	2000	2003	2006	2008	2009	**2011**									
Ethiopia			1991	1999	2006	2007	2008	2008	2009	2010	2011	**2013**										
Uganda				1999	2006	2007	2008	2009	2010	2011	**2012**											
Malawi			1997	2002	2007	2008	2009	2010	2010	2011	**2012**											
Djibouti					2000	2002	2004	2006	2008	2010	**2013**											
Kenya					2004	2006	2007	2008	2010	**2011**												
Liberia			1998	2002	2007	2008	2008	2009	2010	**2012**												
Gambia				1993	2005	2006	2007	2009	2011	**2013**												
Comoros					2003	2006	2008	2010	**2012**													
Ghana					2000	2002	2004	2008	**2012**													
Swaziland					2010	2010	2011	2011	**2013**	1992												
Burundi				2000	2009	2010	2011	**2012**														
Togo					2007	2009	2011	**2013**														
Benin				1999	2009	2010	**2012**															
Mozambique			1996	2002	2010	2011	**2012**															
Zambia				2002	2010	2011	**2012**															
Zimbabwe					2002	2011	**2012**	1993	1992	1990												
Mauritania					2009	**2011**																
Cameroon				2000	2011	**2013**																
Equatorial Guinea				1998	**2012**																	
Burkina Faso			1995	2006	**2013**																	
Lesotho					**2012**	1995	1994															
Cote d'Ivoire				1998	**2013**																	
Guinea			1996	**2003**																		
Niger	1993	1998	2003	**2007**																		
Nigeria			1998	**2007**																		
Dem Rep of the Congo				**2006**																		
Mali		1991	2002	**2008**																		
Guinea-Bissau			1996	**2007**																		
Central African Rep				**2011**																		
Somalia				**2012**																		
Chad			1996	**2012**																		
Sierra Leone		1996	**2005**																			
Angola			**2006**																			

FIGURE 21 S-time-matrix for Under-five mortality rate for Sub-Saharan Africa countries

SOURCE: Own calculations based on data from UN (2014, 2015a).

Indicator level	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
World	1995	1999	2001	2003	2006	2008	2010	**2012**												
Least dev. countries	2002	**2009**																		
Developing regions	1997	2001	2004	2006	2009	**2011**														
Latin America & Car.	1996	2000	2002	2003	2005	2006	2008	2009	2011	**2012**										
Falkland Is (Malvinas)	1996	1997	1997	1997	1998	1998	1998	1998	1998	1999	1999	1999	2000	2003	2004	2004	2005	2005	2007	**2009**
Aruba	1992	1999	2000	2000	2003	2005	2007	2007	2007	2008	2008	2009	2010	2010	2011	2012	**2013**			
Puerto Rico	1997	1999	2000	2001	2003	2006	2007	2008	2009	2010	2011	2011	2012	2012	2012	**2013**				
Bahamas	1995	1999	2001	2002	2003	2005	2008	2009	2010	2010	2010	2011	2011	2011	2012	**2014**				
Barbados	1997	2000	2001	2001	2002	2002	2002	2003	2003	2004	2004	2006	2008	2010	2012	**2014**				
Cayman Islands	1994	1995	1997	1998	2000	2001	2003	2004	2005	2006	2007	2007	2008	2009	**2011**					
Chile	1997	1999	1999	2000	2001	2003	2005	2006	2009	2010	2011	2011	2012	2013	**2014**					
Anguilla	1995	1996	1997	1998	1999	2004	2005	2006	2007	2008	2010	2011	2012	2013	**2014**					
Saint Kitts and Nevis	1993	1999	2001	2002	2002	2004	2005	2005	2006	2007	2008	2009	2010	**2014**						
Trinidad & Tobago	1997	1999	2000	2001	2002	2003	2006	2008	2009	2009	2010	2011	2012	**2014**						
Argentina	1998	1999	2001	2004	2006	2007	2008	2009	2010	2010	2011	2012	**2013**							
Antigua and Barbuda	1992	1999	2001	2003	2003	2004	2006	2007	2009	2010	2011	2012	**2012**							
Dominica	1996	1999	2000	2001	2002	2003	2004	2005	2007	2010	2011	2012	**2013**							
Uruguay	1995	1997	1999	2003	2005	2006	2006	2007	2008	2010	2011	2012	**2014**							
Brazil	1997	2001	2002	2003	2004	2006	2007	2008	2010	2011	2013	**2014**								
Venezuela	1998	2002	2004	2006	2007	2008	2009	2009	2011	2012	2012	**2013**								
St Vincent & Grenadines	1997	2001	2005	2007	2008	2008	2009	2010	2010	2011	2013	**2014**								
Montserrat	1991	1993	1996	1999	2002	2009	2010	2010	2010	2011	**2011**									
Colombia	1998	2002	2004	2006	2007	2008	2009	2010	2011	2012	**2012**									
Saint Lucia	1997	2000	2001	2002	2003	2006	2008	2009	2010	2012	**2014**									
US Virgin Islands	1994	1996	1998	2000	2001	2002	2010	2011	2012	2013	**2014**									
Dominican Republic	1999	2001	2004	2006	2008	2009	2010	2011	2012	**2013**										
Costa Rica	1996	2000	2001	2002	2002	2006	2007	2009	2011	**2012**										
Panama	1997	1999	2003	2006	2007	2007	2008	2008	**2010**											
Mexico	1998	2000	2002	2004	2006	2009	2010	2011	**2012**											
Ecuador	1999	2004	2007	2008	2008	2009	2010	2012	**2013**											
Paraguay	2001	2004	2007	2008	2010	2011	2012	2013	**2014**											
Martinique	1999	2000	2001	2002	2003	2004	2004	2006	**2008**											
Jamaica	1997	2002	2004	2006	2007	2009	2010	2012	**2014**											
Peru	1998	2000	2002	2004	2006	2007	2008	2010	**2014**											
Suriname	1997	2003	2006	2007	2008	2008	2009	2012	**2014**											
Bolivia	1999	2005	2007	2009	2010	2010	2011	**2012**												
Belize	1996	1999	2004	2005	2005	2007	2011	**2013**												
British Virgin Islands	1991	1993	1996	2000	2002	2005	2007	**2009**												
Grenada	1997	2001	2002	2002	2004	2009	2011	**2013**												
Guyana	1998	1999	2001	2007	2008	2009	2010	**2013**												
Cuba	2001	2003	2005	2009	2012	2013	**2014**													
El Salvador	1999	2006	2008	2010	2012	**2013**														
French Guiana	1998	1999	2000	2002	2004	**2008**														
Guadeloupe	1998	2000	2001	2003	**2006**															
Guatemala	2000	2004	2010	2012	**2013**															
Honduras	2000	2003	2009	**2011**																
Nicaragua	2000	2008	2010	**2013**																
Haiti	2002	2004	**2012**																	

FIGURE 22 S-time-matrix for Internet users per 100 inhabitants for Latin America and Caribbean countries

SOURCE: Own calculations based on data from UN (2015b, 2015c).

An overview of disparities of 194 to 201 countries in two dimensions from benchmark Sweden for four selected indicators

In this section we shall illustrate the importance of measuring and analysing disparities in the two dimensions: static proximity in indicators space and proximity in time by S-time-distance. These figures are not directly related to MDG and SDG calculations but rather indicating the background of overall measures of disparity in the world to these issues.

In the next four figures we pose a very large number of countries in the world against a two-dimensional graph showing the position of a given country against benchmark Sweden for a year studied. On the horizontal axis is S-time-distance in years showing time lag (+) or time lead (-) against benchmark Sweden, on the vertical axes the relative static measure in that year is expressed as index (Sweden=100). In some figures in brackets with the index absolute value of the indicator is added. Because of large number of countries on the left side not all country names can be placed but only about every fourth country name can be placed. However, values for all countries are positioned in the figure.

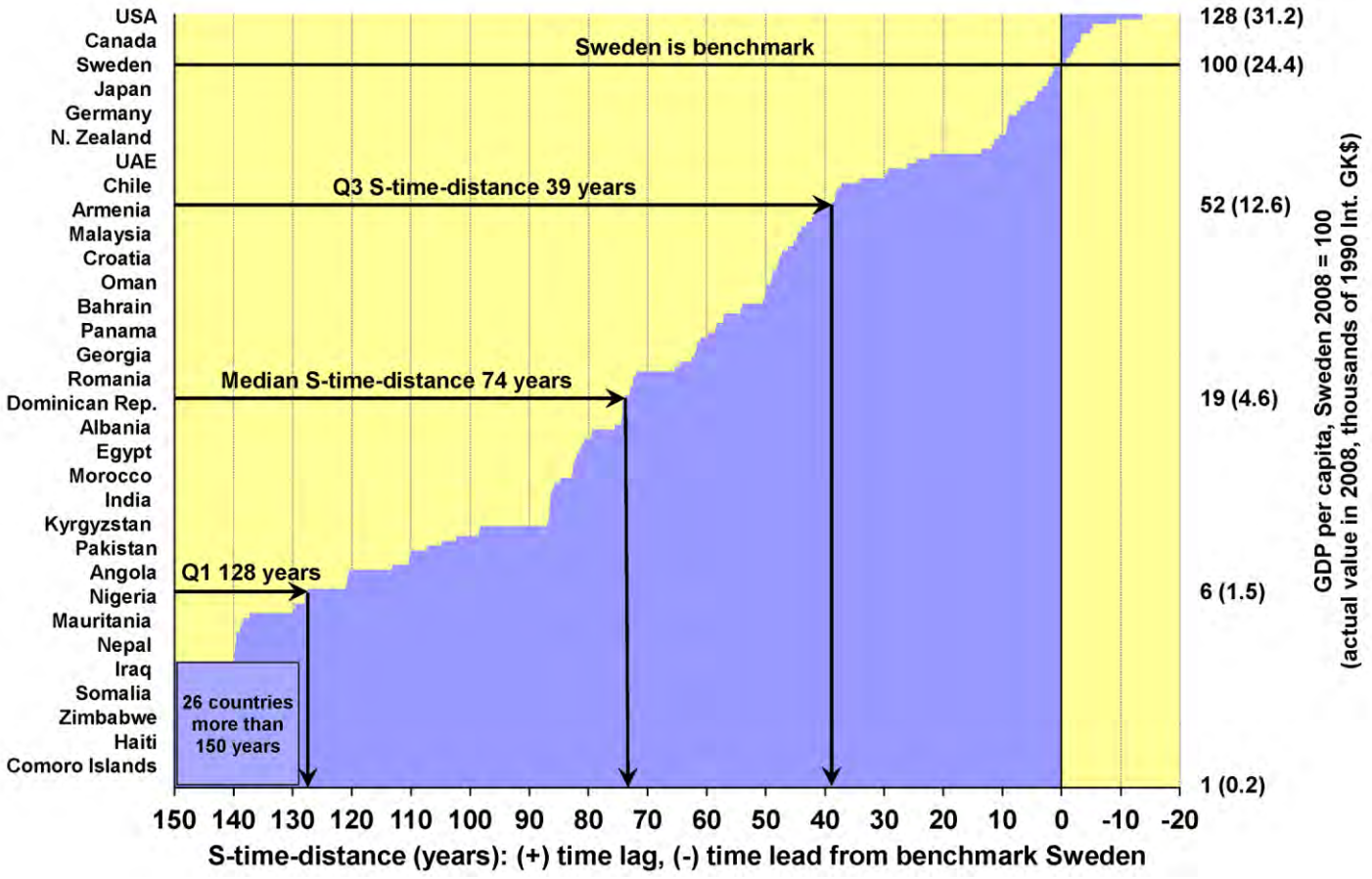


FIGURE 23 S-Time-Distance Showing How Many Years Earlier the 2008 Level of GDP per Capita of a Given Country was Attained in Sweden

SOURCE: Own calculations based on data from Maddison (2010).

Figure 23 gives the situation for 160 countries in 2008 for GDP per capita. Data by Maddison (2010) show vast differences. Static index for the median country is 19 against 100 for Sweden, which means that the value for Sweden is about 5 times higher than that of the median country. The static measure of

inequality can be complemented by S-time-distance measure, for the median country it was 74 years, i.e. that value was achieved in Sweden 74 years earlier. For 26 countries their values in 2008 showed the time gap behind Sweden more than 150 years. The S-time-distance shows an important and understandable perception of one of the dimensions of inequality.

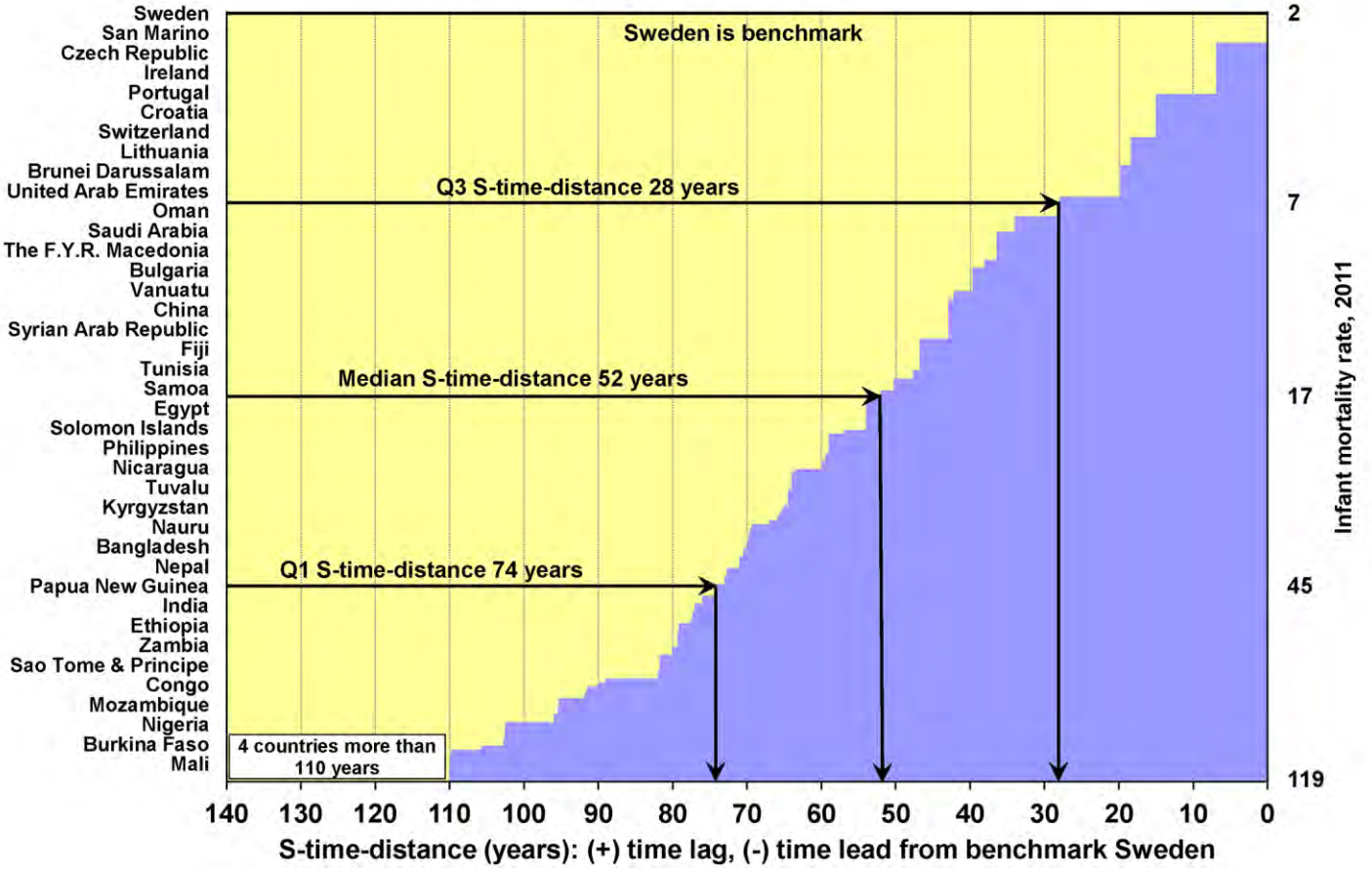


FIGURE 24 S-time-distance for infant mortality rates for 195 countries in 2011 showing how many years earlier such level was attained in the long-term trend of Sweden as the benchmark

SOURCE: Sicherl (2014c), p. 18 (Own calculations based on data from UNICEF (2013); Mitchell (2003) and Eurostat (2013b) for Sweden)

Similarly, in Figure 24 S-time-distance values for infant mortality rates for 195 countries in 2011 showing how many years earlier such level was attained in the long-term trend of Sweden as the benchmark. For the median country time lag was of 52 years. The static relative measure would show that the infant mortality rate was about 8 times higher in the median country than in Sweden. In other words, comparing between indicators, the static ratio would be higher for infant mortality than GDP per capita (8 times against 5 times), but the S-time-distance would show larger degree of inequality for GDP per capita (time lag of 74 years against 52 years). Namely, empirically, when comparing across indicators and periods of time, static and time distance measures of disparity can differ significantly.

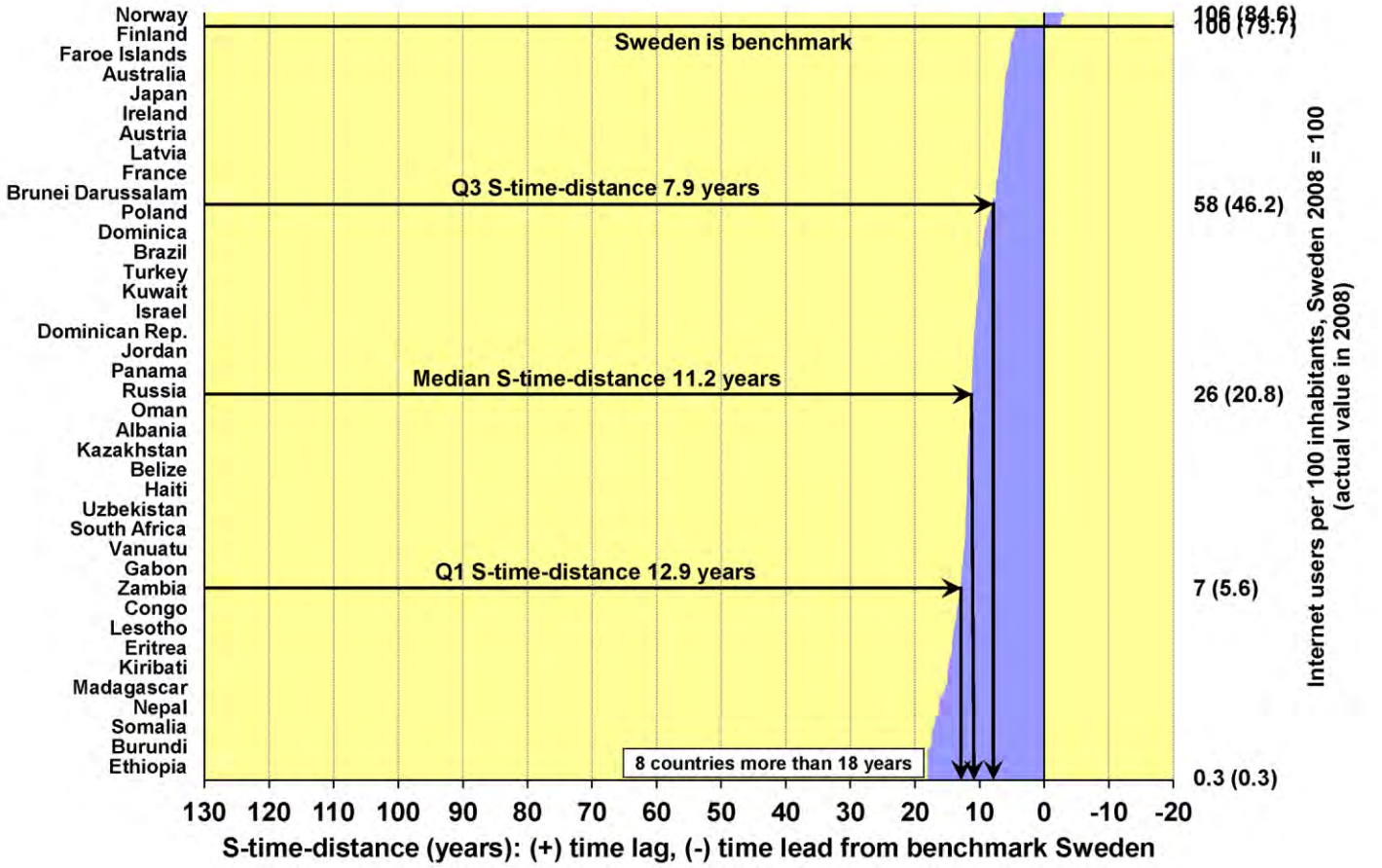


FIGURE 25 S-time-distance for Internet user per 100 inhabitants for 194 countries in 2008 showing how many years earlier such level was attained in the long-term trend of Sweden as the benchmark
SOURCE: Own calculations based on data from ITU (2009), updated from Sicherl (2012), p. 326.

The ICT indicator Internet user per 100 inhabitants shows very different S-time-distances for an indicator with very high growth rate. Median value for time gap behind Sweden is only 11 years, and only 8 countries show a time lag more than 18 years. The absolute static value in Sweden is about 4 times higher, yet the time distance of 11 years is much smaller than 52 years for infant mortality or 74 years for GDP per capita.

Chapter 4

MONITORING IMPLEMENTATION OF MDGS IN TIME DISTANCE PERSPECTIVE

S-time-distance adds a second dimension to comparing actual values with target values, forecast, budget, plan, etc.

This chapter contains two major issues. Firstly, it deals with a specific application of the time distance methodology to monitoring implementation of MDG targets, and more generally to comparing actual values with target values, forecasts, budgets, scenarios and plans.

Monitoring implementation of targets is an integral part of policy making at many levels and in many domains. The innovation is that implementation of targets is described in two dimensions: static deviation from the line to target at a given point in time and S-time-deviation at a given level of the indicator.

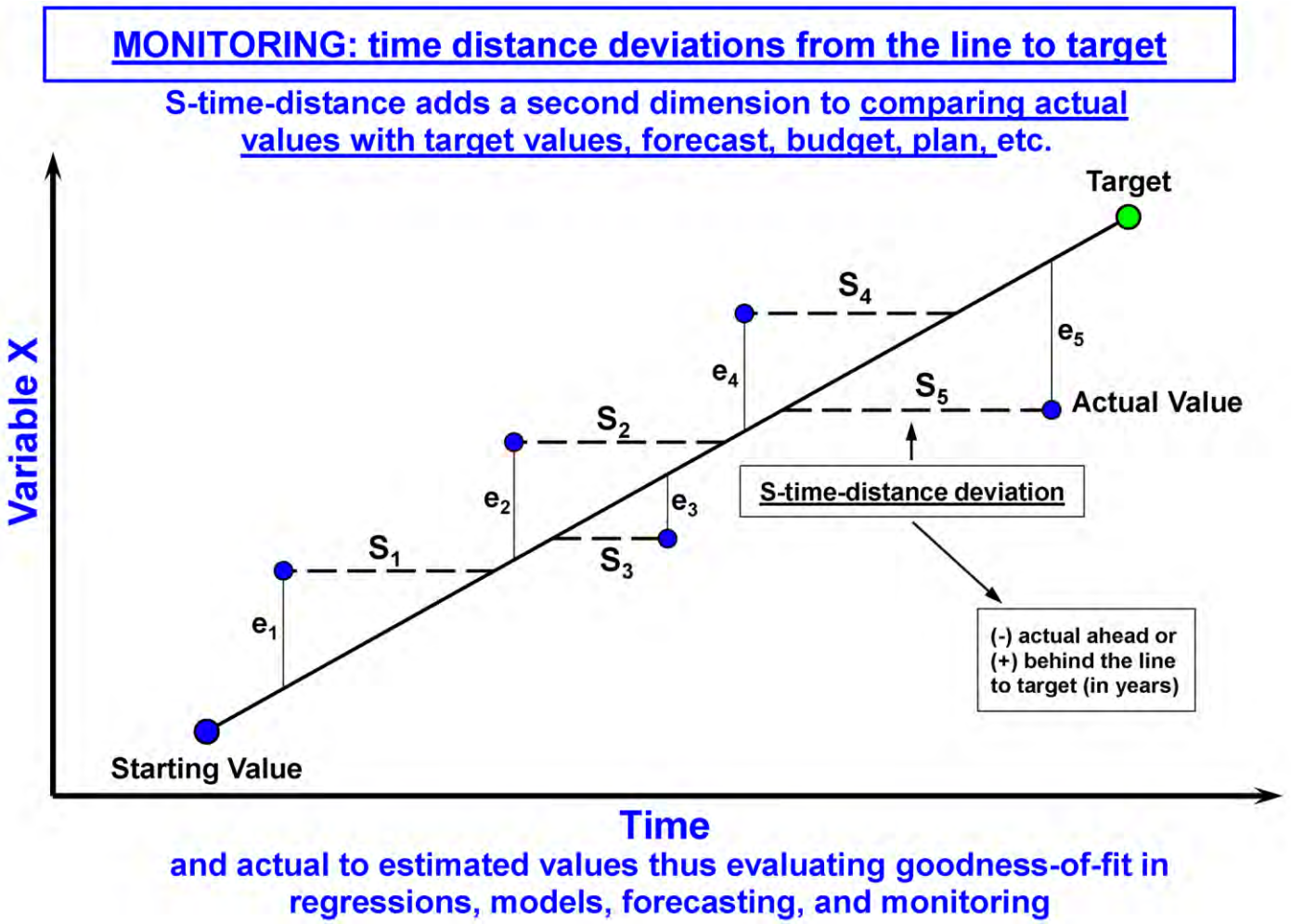


FIGURE 26 Monitoring: time distance deviations from the line to target
SOURCE: Updated from Sicherl (2012), p. 21.

Describing the implementation of targets as leading or lagging in time against the line to well-known targets is a very useful application in the policy debate that enhances knowledge, giving data a value beyond spreadsheets. Expressed in time units, S-time-distance is easily understood by policy makers, managers, media and general public thus being an excellent presentation tool for policy analysis and debate. It can help us to form a new perception of the magnitude of the gap between the implementation and proclaimed targets for a given indicator as well as across more indicators.

People understand time and feel time. The story-telling and the interpretation of the deviation of actual development from the line to target with S-time-distance measure is straightforward and intuitively understandable; for each unit it deals with lead or lag of actual development against the line to their own target for the selected indicator. It is like tracking the actual arrivals in comparison with the train or bus timetable, the difference being that the concept of geographical space is in our application replaced with the indicator space. The characteristics that it is expressed in time units means that it is comparable across variables, fields of concern and units of comparison, which makes S-time-distance an excellent complementary analytical and presentation tool for policy and business debate.

Figures 27 and 28 illustrate how actual values for two MDG indicators deviate from the line to the 2015 targets in the two dimensions for Developing regions. The under-five mortality rate is an example of desired declining indicator and the proportion of population with improved water supply with desired upward development. The 2013 actual value for under-five mortality rate is 50, which is in vertical dimension showing absolute deviation from the expected value on the line to the 2015 target, and also about 30% too high in this respect. In the time distance dimension the value of 50 was on the line to the 2015 target expected to be achieved in about 2008.6, and S-time-distance amounts to 4.4 years of time lag behind the line to target. Similar deviation in both static and time distance dimensions are shown for actual values for other years.

The proportion of population with improved water sources is an example with upward desired trend and a MDG indicator that shows time lead against the line to the 2015 target. Actual value in 2012 was already at the level of the 2015 target and S-time-distance clearly enumerates this advantage, time lead being - 3 years (2012 -2015).

For time distance monitoring of implementation of targets SICENTER developed on www.gaptimer.eu a software tool to facilitate interested users to use the method for their own data. The tool can be accessed on www.gaptimer.eu/s-t-d_monitoring_tool.htm. This tool is described in Annex A3. Donators for developing this tool were Government Office for Growth Republic of Slovenia, The Slovenian Science Foundation, and EUROCHAMBERS, The Association of European Chambers of Commerce and Industry (Brussels).

We are applying this method to evaluate the degree of implementation of existing 2015 MDG targets for world regions, China and India for 10 selected indicators in the Gaptimer Progress Chart below and in the calculation for up to 154 developing countries for five selected MDG indicators in Chapter 5.

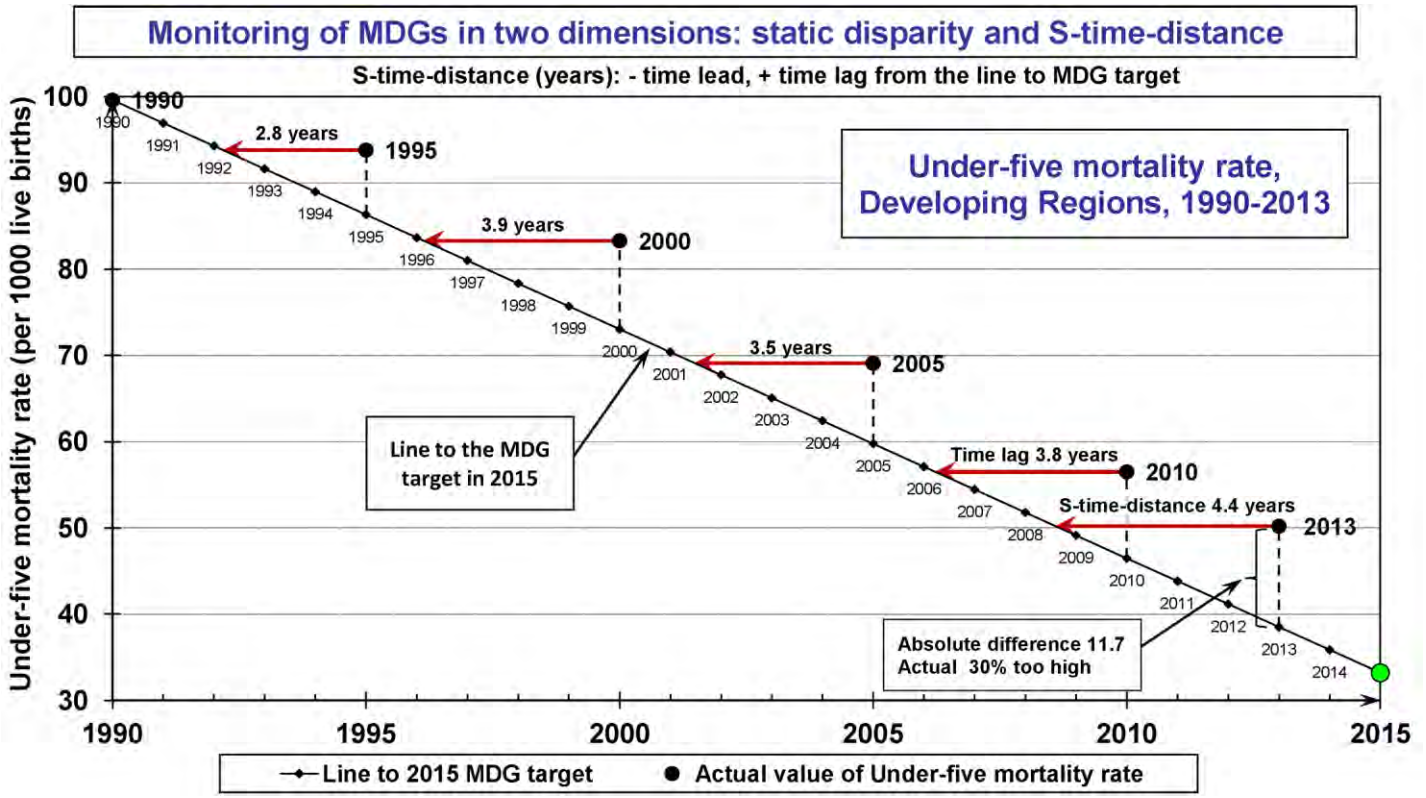


FIGURE 27 Under-five mortality rate, Developing Regions, two dimensions of deviations to the line to target in 2015

SOURCE: Own calculation based on data from UNICEF (2014), Developing Regions, Median variant.

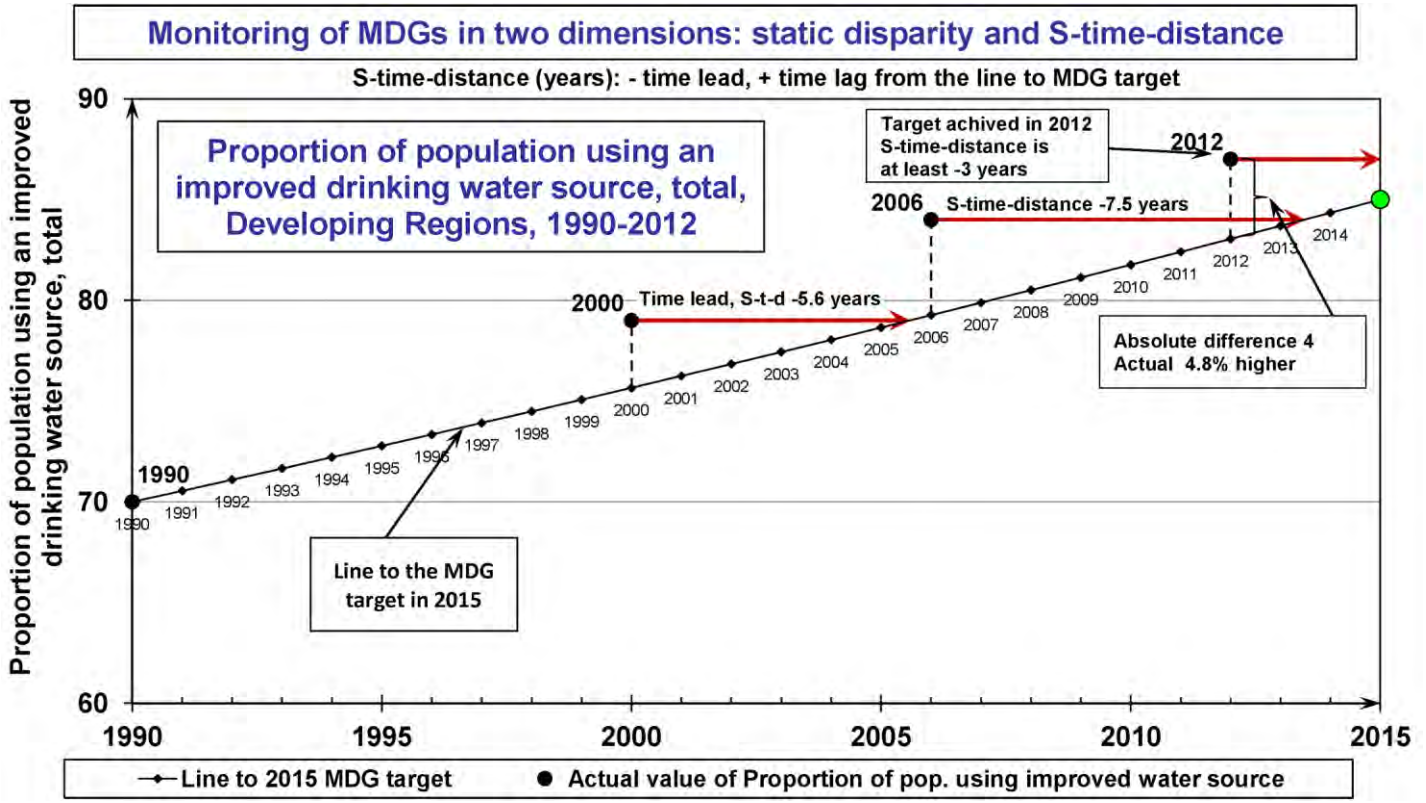


FIGURE 28 Proportion of population using an improved drinking water source, Developing Regions, two dimensions of deviations to the line to target in 2015

SOURCE: Own calculation based on data from UN (2009, 2014) and WHO and UNICEF (2013, p.35).

Gaptimer Progress Chart for world regions, China and India

Measuring implementation involves comparing two sets of data: actual developments over time against the implied time path from the starting point to the 2015 MDG target deadline in the examples shown. We measure deviations in two dimensions. Firstly, one can measure the difference in variables at a given point in time. And secondly, discrepancies in time (either time lead or time lag) are measured. Monitoring implementation in time is like comparing train or bus or airplane arrivals with the timetable provided. In the context of the MDGs, it amounts to comparing the time of actual implementation with the time stipulated by the schedule to the 2015 target.

The Guardian published on their Global development web site my article 'A geek's guide to measuring the MDGs', where Gaptimer progress chart summarised the situation over 7 world regions and 10 selected MDG indicators around 2010. The table below is the update (using data from the latest UN 2015 report on MDGs) that will be available on www.gaptimer.eu.

We are therefore measuring the gap in time. For time distance methodology see my working paper published by the OECD Statistics Directorate. The Gaptimer statistical chart below uses the same identifiers as Formula 1 on TV: minus at time distance and green colour signify that one is ahead in time, and plus at time distance with red colour that one is lagging in time at the chosen point. The point is to ascertain if the developing world is on track, ahead, or behind schedule to achieving MDG goals.

In general the Gaptimer MDG Progress Chart presents in a single table at a glance results for 100 cases across 10 MDG indicators and 10 units (7 world regions, Developing Regions, China, and India) expressed in time lead or time lag providing stories of the situation from the novel time perspective. There are many green colour fields indicating cases where targets have been reached or that indicators are ahead of the line to target, to show the many positive developments in the developing countries. The situation differs among the world regions, but the overall situation shows that the number of cases ahead of the line to target (27+4) is similar to the number of cases behind (19+19).

It is important to emphasise that in absolute terms progress has been made in all selected indicators and in all world regions (though it has been quite uneven across regions and especially across countries within the regions). Furthermore, for countries with delays the application of the magnitude of overall MDG targets to the regional and national cases may have been unrealistic and will be changed for SDGs.

As mentioned below, data used in the Gaptimer Progress Chart are from official UN data sources; the only difference from the official reports is that the same data source is here used to present an additional complementary time distance view of the situation. Since S-time-distance measure is easily understood and comparable between indicators and areas of concern, it is a transparent comparative summary overview over 100 cases, 10 indicators and fields of concern, and 10 world regions. It is condensed in one table with clearly understandable information, combining simplicity with rich potential story-telling.

The 10 presented indicators are from 8 main areas of MDGs. There are many conclusions that can be derived from these results and those in Chapter 5 at the country level. Only a few can be mentioned here

in this book but they could serve as abounding information resource that can be further discussed by interested stakeholders at many levels. However, it should also be mentioned that these results depend on the data quality provided by national and international agencies that we are processing.

Gaptimer Progress Chart for 100 cases

Are we on the track, ahead or behind in time measured by S-time-distance in years (+ time lag, - time lead) comparing with the line to the 2015 MDG targets around 2015

Indicator		Developing Regions	Northern Africa	Sub-Saharan Africa	Latin America and the Caribbean	Eastern Asia	Southern Asia	South-Eastern Asia	Western Asia	CHINA	INDIA
IND 1.1	Proportion of population living below $1.25 (PPP) per day (2011)	TA (-5)	TA (-5)	12.3	TA (-5)	TA (-10)	TA (-4)	TA (-10)	TA (-4)	TA (-13)	TA (-4)
IND 1.8a	Prevalence of underweight children under-five years of age	N/A	TA (-3)	9.5	TA (-3)	TA (-3)	3.0	0.8	TA (-3)	TA (-10)	5.9
IND 2.1a	Net enrolment ratio in primary education	10.0	0.6	8.7	10.5	17.8	4.5	20.3	6.9	N/A	-1.6
IND 3.1a	Ratio of girls to boys in primary education	3.5	4.9	10.0	N/A	2.9	TA (-3)	TA	9.1	TA (-14)	TA (-7)
IND 4.1	Under-five mortality rate (2013)	4.3	-1.7	4.8	TA (-2)	TA (-3)	1.9	0.8	-0.1	TA (-6)	1.2
IND 5.1	Maternal mortality ratio (2013)	7.5	4.0	6.8	9.9	1.3	1.6	4.3	8.6	0.7	1.0
IND 6.10b	Tuberculosis patients successfully treated under short course (2012)	7.2	9.0	5.7	11.7	7.2	5.9	11.7	8.9	8.4	11.4
IND 7.8t	Proportion of population using an improved drinking water source, total	TA (-3)	1.9	4.9	TA (-3)	TA (-3)	TA (-3)	TA (-3)	TA (-3)	TA (-12)	TA (-10)
IND 7.9t	Proportion of population using an improved sanitation facility, total	7.0	TA (-3)	19.1	0.7	TA	6.4	1.6	TA	TA	7.7
IND 8.16	Internet users per 100 inhabitants (2013)	TA (-3)	TA (-3)	-0.6	TA (-3)	TA (-3)	0.0	TA (-2)	TA (-3)	TA (-6)	0.0

S-time-distance measure: deviation (in years) from path to target, (+) time lag, (-) time lead
TA (-x): 2015 target already achieved x years before 2015

An overview of the situation in the 7 world regions:

2015 Target achieved	27 cases
Time lead	4 cases

Time lag less than 6 years	19 cases
Time lag 6 years or more	19 cases

FIGURE 29 Gaptimer Progress Chart of MDG implementation for world regions, China and India
SOURCE: Own calculations based on data from MDG Report 2015, Statistical Annex, UN (2015b). For China and India, UN (2015c).

	Developing Regions	Northern Africa	Sub-Saharan Africa	Latin America and the Caribbean	Eastern Asia	Southern Asia	South-Eastern Asia	Western Asia	CHINA	INDIA
Target achieved	3	4	0	5	6	3	4	5	7	3
Time lead	0	1	1	0	0	1	0	1	0	2
Time lag less than 6 years	2	4	3	1	2	5	4	0	1	3
Time lag 6 years or more	4	1	6	3	2	1	2	4	1	2

TABLE 5 Gaptimer Progress Chart of MDG, grouping by magnitude of S-time-distances by implementation across world regions
SOURCE: Own calculations based on data from MDG Report 2015, Statistical Annex, UN (2015b). For China and India, UN (2015c), available in Figure 29.

Tables 5 and 6 draw attention to some quick messages about the magnitude of being on track, ahead or behind in time against the expected position on the line to the respective 2015 target; by world regions and by selected MDG indicators. By number of indicators that have already two or more years before 2015 achieved their 2015 target the outstanding regions are Chine and Eastern Asia with seven and 6 cases out of 9, followed by Northern Africa and Latin America & Caribbean with 5 cases. Sub-

Saharan Africa is the only world region with no case of 'Target achieved' and 6 cases where S-time-lag is 6 years or more.

Indicator	IND 1.1 Proportion of population living below $1.25 (PPP) per day (2010)	IND 1.8a Prevalence of underweight children under-five years of age	IND 2.1a Net enrolment ratio in primary education	IND 3.1a Ratio of girls to boys in primary education	IND 4.1 Under-five mortality rate (2013)	IND 5.1 Maternal mortality ratio (2013)	IND 6.10b Tuberculosis patients successfully treated under short course (2011)	IND 7.8t Proportion of population using an improved drinking water source, total	IND 7.9t Proportion of population using an improved sanitation facility, total	IND 8.16 Internet users per 100 inhabitants
Target achieved	8	5	0	4	3	0	0	7	4	6
Time lead	0	0	1	0	2	0	0	0	0	3
Time lag less than 6 years	0	3	2	2	4	6	2	2	2	0
Time lag 6 years or more	1	1	5	2	0	3	7	0	3	0

TABLE 6 Gaptimer Progress Chart of MDG, grouping by magnitude of S-time-distances by implementation across ten selected indicators

SOURCE: Own calculations based on data from MDG Report 2015, Statistical Annex, UN (2015b). For China and India, UN (2015c), available in Figure 29.

Gaptimer Progress Chart for 100 cases (sorted)

Are we on the track, ahead or behind in time measured by S-time-distance in years (+ time lag, - time lead) comparing with the line to the 2015 MDG targets around 2015

Indicator		Developing Regions	Northern Africa	Sub-Saharan Africa	Latin America and the Caribbean	Eastern Asia	Southern Asia	South-Eastern Asia	Western Asia	CHINA	INDIA
IND 1.1	Proportion of population living below $1.25 (PPP) per day (2011)	TA (-5)	TA (-5)	12.3	TA (-5)	TA (-10)	TA (-4)	TA (-10)	TA (-4)	TA (-13)	TA (-4)
IND 7.8t	Proportion of population using an improved drinking water source, total	TA (-3)	1.9	4.9	TA (-3)	TA (-3)	TA (-3)	TA (-3)	TA (-3)	TA (-12)	TA (-10)
IND 8.16	Internet users per 100 inhabitants (2013)	TA (-3)	TA (-3)	-0.6	TA (-3)	TA (-3)	0.0	TA (-2)	TA (-3)	TA (-6)	0.0
IND 1.8a	Prevalence of underweight children under-five years of age	N/A	TA (-3)	9.5	TA (-3)	TA (-3)	3.0	0.8	TA (-3)	TA (-10)	5.9
IND 7.9t	Proportion of population using an improved sanitation facility, total	7.0	TA (-3)	19.1	0.7	TA	6.4	1.6	TA	TA	7.7
IND 4.1	Under-five mortality rate (2013)	4.3	-1.7	4.8	TA (-2)	TA (-3)	1.9	0.8	-0.1	TA (-6)	1.2
IND 3.1a	Ratio of girls to boys in primary education	3.5	4.9	10.0	N/A	2.9	TA (-3)	TA	9.1	TA (-14)	TA (-7)
IND 5.1	Maternal mortality ratio (2013)	7.5	4.0	6.8	9.9	1.3	1.6	4.3	8.6	0.7	1.0
IND 2.1a	Net enrolment ratio in primary education	10.0	0.6	8.7	10.5	17.8	4.5	20.3	6.9	N/A	-1.6
IND 6.10b	Tuberculosis patients successfully treated under short course (2012)	7.2	9.0	5.7	11.7	7.2	5.9	11.7	8.9	8.4	11.4

S-time-distance measure: deviation (in years) from path to target, (+) time lag, (-) time lead
TA (-x): 2015 target already achieved x years before 2015

An overview of the situation in the 7 world regions:

2015 Target achieved	27 cases	Time lag less than 6 years	19 cases
Time lead	4 cases	Time lag 6 years or more	19 cases

FIGURE 29a Gaptimer Progress Chart of MDG implementation for world regions, China and India (sorted)

SOURCE: Own calculations based on data from MDG Report 2015, Statistical Annex, UN (2015b). For China and India, UN (2015c).

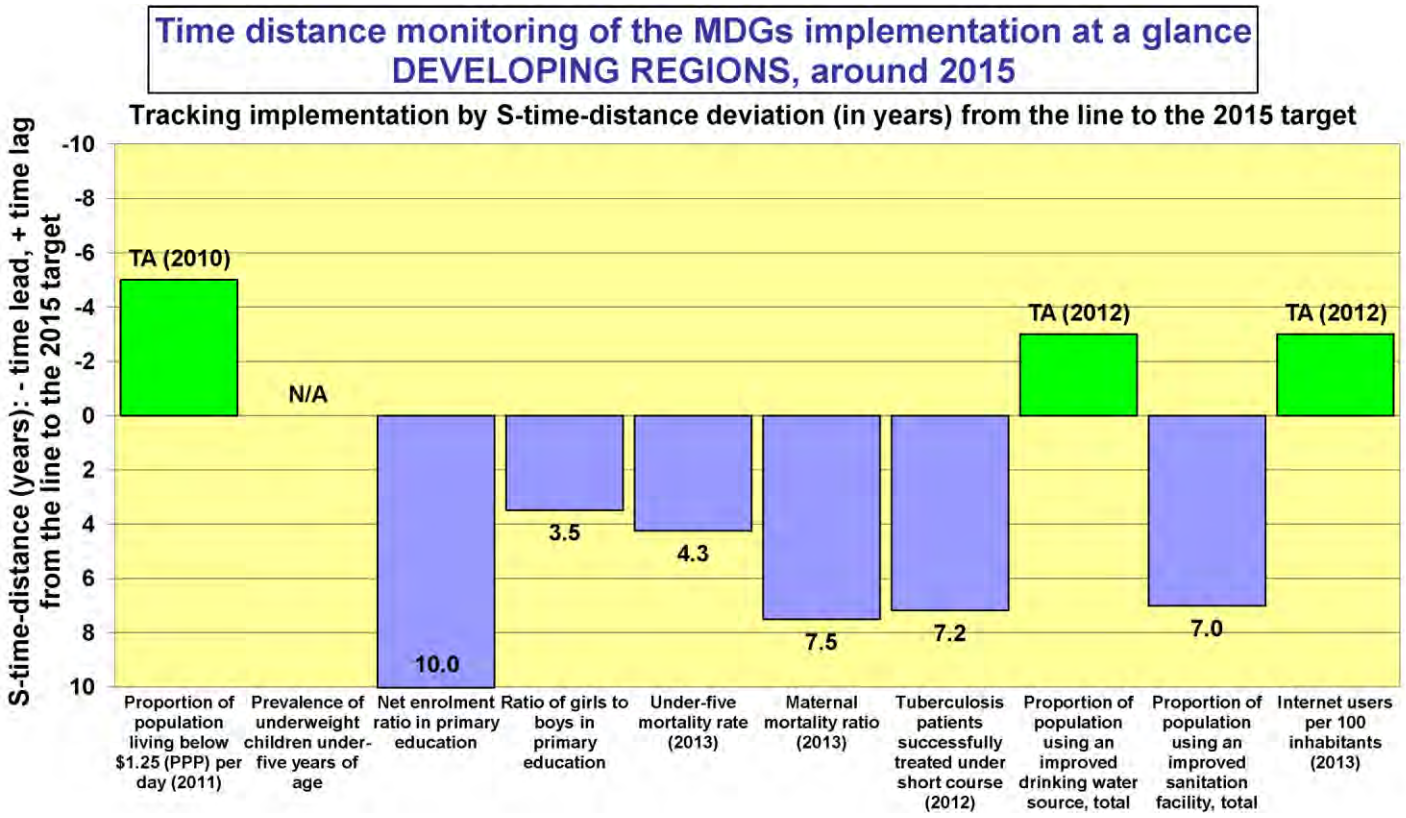


FIGURE 30 S-time-distance in years as a time measure of the MDG implementation: (-) time lead, (+) time lag from the line to 2015 target

SOURCE: Based on data in Gaptimer Progress Chart, Figure 29.

The situation across 10 selected MDG indicators can be visually observed in Figure 30, while more details in Table 6 show that the best performance against the MDG targets were IND 1.1 Proportion of population living below $1.25 (PPP) per day (2011), IND 18.6 Internet users per 100 inhabitants, IND 7.8t Proportion of population using an improved drinking water source, total and IND 1.8a Prevalence of underweight children under-five years of age. The three of these indicators showed that at least 5 regions have already reached their 2015 targets. Figure 29a shows Gaptimer Progress Chart sorted by number of cases being ahead in time before 2015 targets. These indicators are in the first four rows.

For the next three indicators, IND 4.1 Under-five mortality rate (2013), IND 3.1a Ratio of girls to boys in primary education, and IND 7.9t Proportion of population using an improved sanitation facility, total, are in the next three rows. There are still possibilities for improvements in the first indicator, for the second there are large delays in Sub-Saharan Africa and Western Asia, very large delays for sanitation facilities for Sub-Saharan Africa and India with Southern Asia.

On the other side, with largest time delay with S-time-distance deviations against their line to 2015 MDG target are IND 5.1 Maternal mortality ratio (2013), IND 2.1a Net enrolment ratio in primary education and IND 6.10b Tuberculosis patients successfully treated under short course (2011). For all three of them no world region 2015 targets were already achieved. For net enrolment ratio in primary education India was ahead of the line to target and might still reach their 2015 targets. In general this is the indicator where the discrepancy between desirability of the target and shown feasibility was most pronounced.

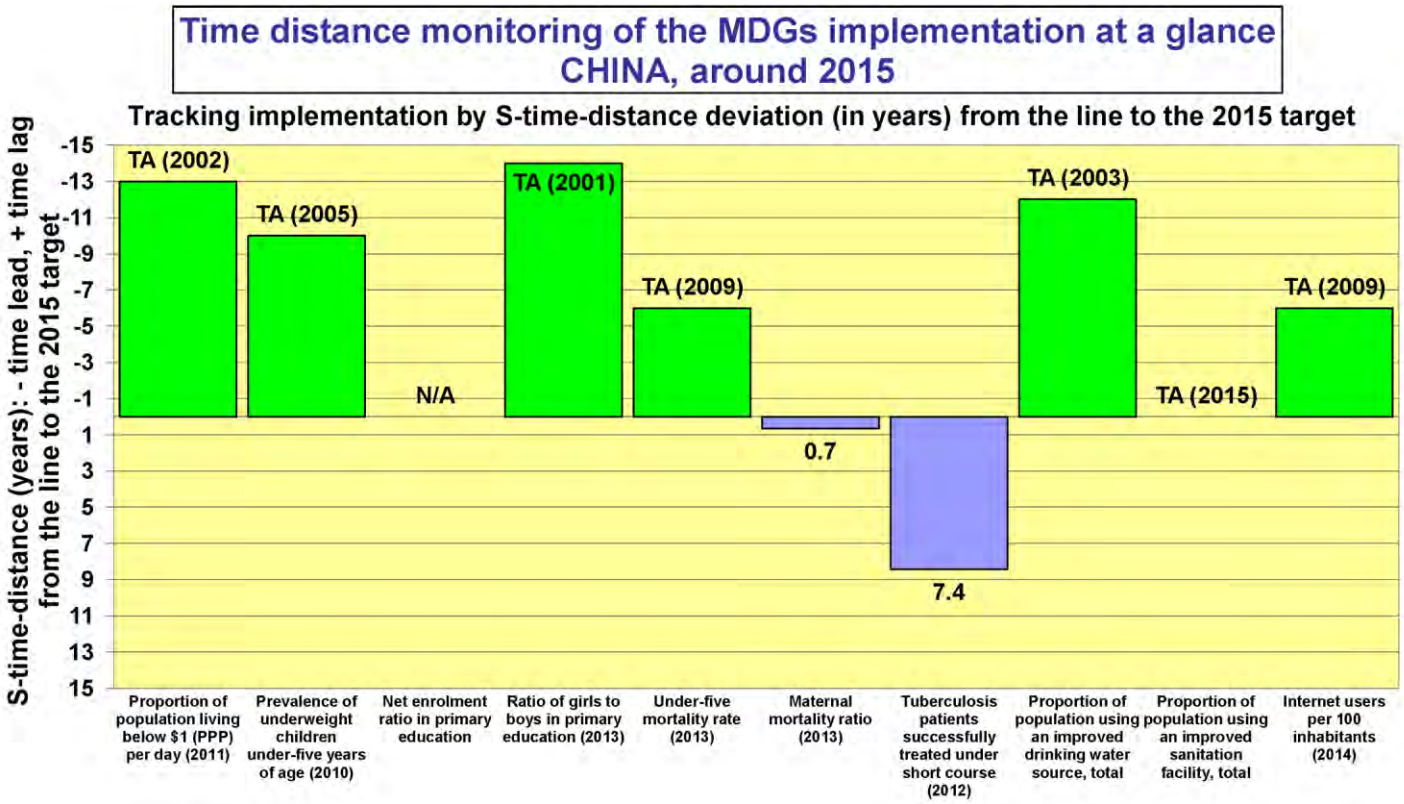


FIGURE 31 Results of S-time-distance monitoring of MDGs for China for ten selected indicators
SOURCE: Based on data in Gaptimer Progress Chart, Figure 29.

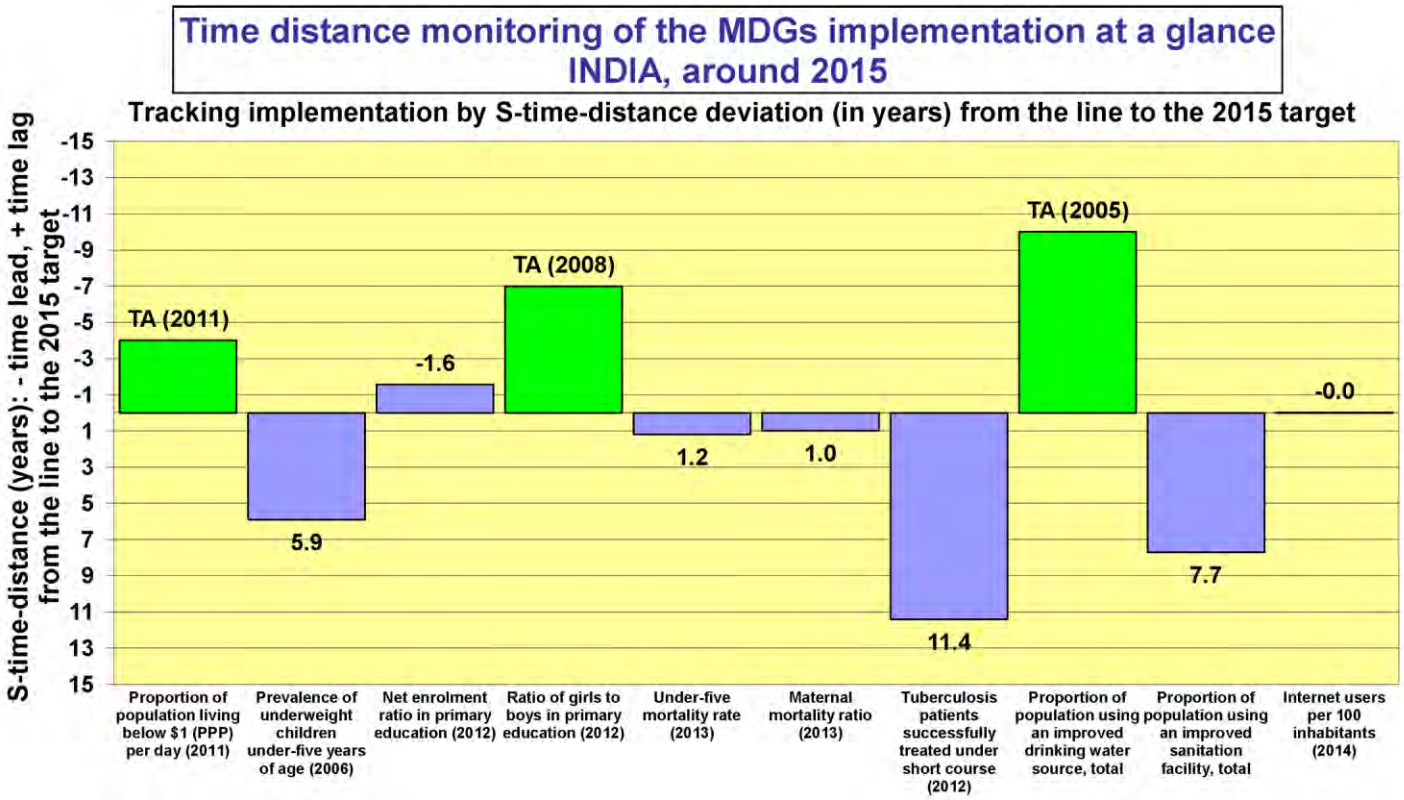


FIGURE 32 Results of S-time-distance monitoring of MDGs for India for ten selected indicators
SOURCE: Based on data in Gaptimer Progress Chart, Figure 29.

Figures 31 and 32 illustrate the results of S-time-distance monitoring of MDGs for China and India for ten selected indicators around 2015, while the detailed calculations over the period 1990 – 2015 for

the two countries by years from available MDG databases are presented in Tables 7 and 8. These figures and tables are another example of the time distance results of the implementation of MDG targets at the country level. These tables can follow the implementation in this specific manner year by year, from the first year (or any other time unit) during the period if data on actual developments and targets are available. Namely, at the country level it is possible to take into account the specific policies and circumstances that might have influenced the outcomes, which is beyond the possibility of this study.

Figure 31 and Table 7 show the excellent performance of China in implementing the respective MDG targets. The high green bars in the figure indicate how much time lead China experienced, with four indicators showing S-time-distance to be more than 10 years ahead of time; in other words, China started to achieve their respective 2015 targets soon after first decade of the 1990-2015 MDG period.

TABLE 7 Results of S-time-distance monitoring of MDGs for China for ten selected indicators

Indicator	IND 1.1	IND 1.8a	IND 3.1a	IND 4.1	IND 5.1	IND 6.10b	IND 7.8t	IND 7.9t	IND 8.16
	Proportion of population living below $1.25 (PPP) per day	Prevalence of underweight children under-five years of age	Ratio of girls to boys in primary education	Under-five mortality rate	Maternal mortality ratio	Tuberculosis patients successfully treated under short course	Proportion of population using an improved drinking water source, total	Proportion of population using an improved sanitation facility, total	Internet users per 100 inhabitants
1990	0	0	0	0	0		0	0	
1991			-1.6	0.7			-0.7	-0.2	
1992		> 2	-5.8	1.			-3.	-0.4	
1993	-1.8		-4.8	1.1			-3.6	-0.5	
1994			-6.3	0.9		0	-5.7	-0.6	
1995		-2.5	-10.3	0.6	-2.2	-3.8	-6.3	-0.7	
1996	-13.2		-11.8	0.2		-5.2	-6.8	-0.8	0
1997			-13.2	-0.2		-6.6	-8.8	-0.9	-1.6
1998		-14.6	-14.6	-0.6		-5.6	-9.3	-1.9	-4.9
1999	-11.4			-1.2		-4.6	-9.7	-1.9	-7.3
2000		-10.6		-1.8	-1.7	1.2	-10.1	-1.9	-8.5
2001			TA	-2.6		-2.6	-11.9	-1.9	-8.5
2002	TA	-11.	TA	-3.5		5.6	-12.3	-1.8	-8.9
2003			TA	-4.4		4.2	TA	-1.8	-8.6
2004				-5.2		7.6	TA	-2.6	-8.
2005	TA	TA		-5.9	-1.2	8.6	TA	-2.5	-7.3
2006			TA	-6.3		9.6	TA	-2.4	-6.9
2007			TA	-6.6		8.2	TA	-2.3	-6.9
2008	TA	TA	TA	-6.7		9.2	TA	-2.1	-6.7
2009		TA	TA	TA		7.8	TA	-2.8	TA
2010	TA	TA	TA	TA	-1.	6.4	TA	-2.6	TA
2011	TA		TA	TA		7.4	TA	-2.4	TA
2012			TA	TA		8.4	TA	-1.4	TA
2013			TA	TA	0.7		TA	-1.2	TA
2014							TA	-0.2	TA
2015							TA	TA	

SOURCE: Own calculations based on data from UN (2015c).

Table 7 with yearly levels of S-time-deviations from the lines to respective 2015 targets shows two points. Firstly, for some indicators the yearly data in the MDG database are scarce. Secondly, the development in China started very well already in the beginning, for most indicators the light green colour shows that the early years were already ahead of the line to target. For four indicators the S-time-distances accelerated fast to values beyond -10 years, so that already in 2001 targets was achieved for ratio of girls to boys, in 2002 for poverty decrease, in 2003 for improved water sources, in 2005 for improvements in underweight children.

TABLE 8 Results of S-time-distance monitoring of MDGs for India for ten selected indicators

Indicator	IND 1.1	IND 1.8a	IND 2.1a	IND 3.1a	IND 4.1	IND 5.1	IND 6.10b	IND 7.8t	IND 7.9t	IND 8.16
	Proportion of population living below $1.25 (PPP) per day	Prevalence of underweight children under-five years of age	Net enrolment ratio in primary education	Ratio of girls to boys in primary education	Under-five mortality rate	Maternal mortality ratio	Tuberculosis patients successfully treated under short course	Proportion of population using an improved drinking water source, total	Proportion of population using an improved sanitation facility, total	Internet users per 100 inhabitants
1990			0	0	0	0		0	0	
1991				-1.2	0.			-0.9	1	
1992		0		-1.3	-0.1			-1.7	0.9	
1993	0	-0.4		-3.5	0.			-2.6	0.8	
1994				-3.5	-0.1		0	-3.4	0.7	
1995				-2.5	0.	-1.	> 1	-4.2	0.7	0
1996				-2.5	-0.1		> 2	-4.9	0.8	-0.5
1997		-7.6		-2.5	-0.1		> 3	-5.7	0.9	-0.5
1998				-1.5	-0.2		> 4	-6.4	1.	-1.5
1999		1.3		-1.5	-0.2		> 5	-7.1	1.2	-2.5
2000			0.8	-0.5	-0.3	-1.3	> 6	-7.7	1.4	-3.5
2001			1.7	-0.5	-0.3		> 7	-8.4	1.7	-3.2
2002			2.7	-1.4	-0.3		> 8	-9.	1.9	-4.7
2003			-2.2	-9.5	-0.3		> 9	-9.6	2.2	-4.
2004	4.1				-0.3		> 10	-10.2	2.5	-3.4
2005					-0.3	-1.7	5.7	TA	2.9	-3.
2006		5.9			-0.2		6.7	TA	3.2	-2.5
2007			-7.1	-6.3	0.		6.4	TA	3.6	-2.5
2008			-6.6	TA	0.1		7.4	TA	4.	-1.8
2009	1.1		-5.	TA	0.2		7.1	TA	4.4	-1.3
2010			-4.3	TA	0.4	-0.2	8.1	TA	4.8	-1.4
2011	TA		-2.9	TA	0.6		9.1	TA	5.3	-1.3
2012			-1.6	TA	0.9		11.4	TA	6.3	-1.
2013					1.2	1.		TA	7.3	-0.5
2014								TA	8.3	0.
2015								TA	7.7	

SOURCE: Own calculations based on data from UN (2015c).

For India the data on poverty reduction are very few, in 2011 it reached the 2015 target, so that all units in the first row of the Gaptimer Progress Chart (with exception of the Sub-Saharan Africa) reached the poverty reduction MDG target; a very important achievement.

For three other indicators light green colours indicate being ahead of the line to target, achieving the target for improved drinking water sources in 2005 and for ratio of girls to boys in 2008. For Internet users per 100 inhabitants India is close to reaching the target.

Chapter 5

S-TIME-DISTANCE RESULTS OF MDG IMPLEMENTATION FOR UP TO 154 DEVELOPING COUNTRIES FOR FIVE SELECTED INDICATORS

The results in Gaptimer Progress Chart for the world regions in Chapter 4 are here extended with the results at the country level for five selected MDG indicators. With respect to the percentage of available country cases where the 2015 target was already achieved, the overall situation is very similar: 43% of cases of 5 selected indicators in developing countries analysed were ahead of the line to their respective 2015 target. In about 9% of available cases no progress was registered.

For more detailed analysis, in the Annex A4 we provide Excel files of results of time distances in which time lead or time lag from the line to the respective MDG 2015 targets are shown for 125-154 developing countries respectively for the four selected indicators. Interested readers will be able to download the Excel files over the analysed period, to analyse all individual country results and select results for those countries that they would like to compare with (e.g. by regions like African countries or simply with neighbouring countries). Similarly it would be possible to combine values for different indicators for a given country or selection of countries by interest of the user.

However, this monitoring method can be applied much more widely. Firstly, world regions can be exchanged with countries, regions within countries, or socio-economic groups, sectors, etc. Secondly, units could be products of an enterprise, budget activities or operational projects, etc., or relevant Key Performance Indicators (KPIs).

	Developing Regions	Northern Africa	Sub-Saharan Africa	Latin America and the Caribbean	Eastern Asia	Southern Asia	South-Eastern Asia	Western Asia	Oceania
Number of countries (with at least one case)	160	5	50	46	6	9	11	13	20
Percentage of available cases									
Total ahead	43%	60%	24%	49%	62%	60%	60%	52%	46%
Target achieved	33%	40%	13%	41%	57%	49%	49%	47%	36%
Time lead	10%	20%	11%	8%	5%	11%	11%	5%	10%
Time lag less than 6 years	23%	20%	26%	19%	10%	29%	26%	23%	19%
Time lag 6 years or more	25%	8%	42%	20%	14%	11%	9%	13%	23%
No progress	9%	12%	8%	12%	14%	0%	4%	13%	13%

TABLE 9 Summary of country results for 5 indicators over developing regions around 2012
SOURCE: Own calculations based on data from UN (2015a).

Even for the restricted selection of five indicators for potential 170 developing countries, for about 15% of all possible cases some data is not available. Nevertheless, the percentages of available cases by being ahead or behind in time from the line to 2015 targets can be for Developing Regions broadly compared to that in the Gaptimer MDG Progress Chart for world regions for 10 indicators.

The table above enables the analysis of the distribution of cases by time distance categories also for 8 world regions. For a number of countries the time series of certain indicators (e.g. proportion of population with improved sanitation or improved drinking water sources) are constant throughout of the analysed period. For such countries the values of deviations from the line to target are not appropriate as there are minimal differences between the target and the constant actual value, so that the time distance deviation would exaggerate these very small differences. Therefore we have eliminated values in the corresponding tables so that rows for these countries are empty.

Under-five mortality rate for 136 countries

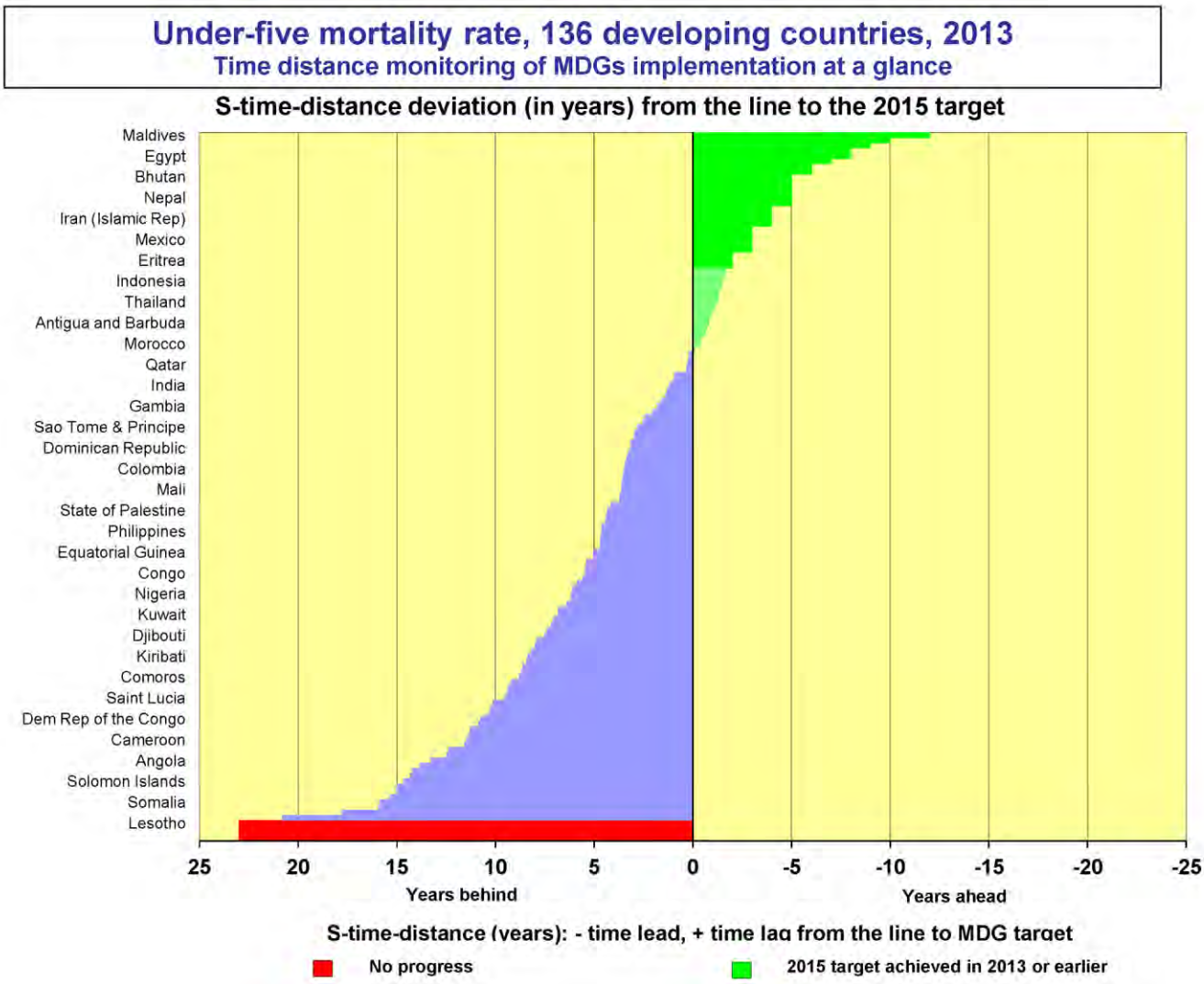


FIGURE 33 S-Time-Distance monitoring MDGs for indicator Under-five mortality rate in 2013
SOURCE: Own calculations based on data from UN (2015a).

In Figure 33 a rapid visualisation of the situation in 2013 for the summary overview over 136 countries is available. Darker green bars present countries which have already achieved their 2015 targets, lighter green countries for which the S-time-distance indicates that they are in time ahead of their line to target. The violet bars indicate the countries behind the line to target, and the red ones those countries that showed no progress. As mentioned before, the country names for only every fourth country can be presented due to lack of space on the vertical axes.

In Table 10 for under-five mortality rate S-time-distances for 136 countries they are sorted by in each given world region by the descending order from the best performers of the S-time-distance in 2013. This example shows how tables for a given indicator could look in the regional reports on MDG implementation over the whole analysed period. The tables can be compressed either by columns for given years or by rows to concentrate on selected countries of interest.

This table demonstrates how time distance monitoring of implementation of targets can look like for any number of units and indicators from different fields of concern. It can follow the implementation in this specific manner year by year, from the first year (or any other time unit) on if data on actual developments and targets are available.

Looking backwards on the past MDG period it gives food for thought to evaluate the developments from the time distance perspective, to discuss suitability of setting up the MDG targets, and to discuss performance in given countries, neighboured countries or desired benchmarks. For post-2015 Sustainable Development Goals and corresponding targets these tables and figures show the example how a system of monitoring implementation in the time perspective is already available for immediate use, for SDG targets as well as for budget and project implementation in the time dimension, to complement other methods of monitoring implementation of targets.

For under-five mortality rate in each world region, with the exception of Oceania, there are several countries which have before 2015 reached their MDG target (2 countries in Northern Africa, 6 in Sub-Saharan Africa, 5 in Latin America & Caribbean, 2 in Eastern Asia, 5 in Southern Asia, 2 in South-Eastern Asia, and 4 in Western Asia.

There is a vast number of possible comparisons and conclusions arising from the provided material that cannot be discussed here but could be productively undertaken at country and regional levels. Namely, at that level it is possible to take into account the specific policies and circumstances that might have influenced the outcomes.

There are two major reasons that could influence the delays in implementation of the particular MDG targets. On the one hand, it is a question of performance of a given country in the area analysed; or it could be a consequence that using the same overall targets of 2/3 decrease in the under-five mortality rate might have placed certain countries at unfair disadvantage not understanding their real capabilities, on the other.

TABLE 10 Results of S-time-distance monitoring of MDGs for Under-five mortality rate

Countries \ Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Northern Africa																								
Egypt	0	-0.8	-1.6	-2.4	-3.3	-4.2	-5.1	-5.9	-6.6	-7.2	-7.8	-8.2	-8.5	-8.8	-9.	-9.	-8.9	TA	TA	TA	TA	TA	TA	TA
Tunisia	0	-0.8	-1.5	-2.	-2.6	-3.2	-3.8	-4.3	-4.7	-5.1	-5.4	-5.7	-5.9	-6.	-6.	-6.	-5.9	-5.8	-5.6	-5.4	TA	TA	TA	TA
Libya	0	-0.8	-1.5	-2.	-2.4	-2.6	-2.7	-2.7	-2.7	-2.6	-2.4	-2.3	-2.1	-2.	-1.9	-2.1	-2.3	-2.6	-2.9	-2.9	-2.7	-2.4	-2.1	-1.7
Morocco	0	-0.7	-1.3	-1.8	-2.4	-2.8	-3.2	-3.5	-3.7	-3.8	-3.9	-3.9	-3.9	-3.7	-3.6	-3.4	-3.1	-2.8	-2.5	-2.1	-1.7	-1.3	-0.9	-0.4
Algeria	0	0.	0.4	0.8	1.1	1.5	1.9	2.3	2.9	3.5	4.	4.4	4.6	4.6	4.5	4.3	4.1	3.9	4.	4.1	4.3	4.7	5.	5.6
Sub-Saharan Africa																								
Liberia	0	> 1	1.8	2.2	2.3	2.2	1.8	1.3	0.6	-0.2	-1.	-1.9	-2.7	-3.5	-4.1	-4.7	-5.2	-5.4	-5.5	-5.4	TA	TA	TA	TA
Malawi	0	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.1	-0.3	-0.9	-1.6	-2.3	-3.	-3.6	-4.1	-4.4	-4.7	-4.9	-5.	-4.9	TA	TA	TA
Ethiopia	0	0.2	0.3	0.1	-0.2	-0.4	-0.7	-0.9	-0.9	-0.9	-0.9	-1.	-1.2	-1.6	-2.	-2.5	-2.9	-3.3	-3.6	-3.7	-3.7	-3.5	TA	TA
U. Rep of Tanzania	0	0.7	1.4	2.2	2.8	3.3	3.6	3.7	3.4	2.9	2.	1.1	0.1	-0.8	-1.6	-2.3	-2.8	-3.2	-3.5	-3.6	-3.7	-3.7	TA	TA
Eritrea	0	-0.6	-1.2	-2.	-2.7	-3.3	-3.9	-4.4	-4.8	-5.1	-5.3	-5.4	-5.4	-5.4	-5.3	-5.1	-4.9	-4.7	-4.4	-4.1	-3.7	-3.2	-2.7	TA
Niger	0	0.3	0.3	0.2	-0.1	-0.6	-1.	-1.3	-1.4	-1.5	-1.5	-1.6	-1.8	-2.1	-2.4	-2.7	-3.	-3.2	-3.3	-3.4	-3.4	-3.2	-2.9	TA
Rwanda	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	11.9	8.9	6.2	3.8	1.9	0.3	-0.8	-1.4	-1.8	-2	-1.9	-1.7
Madagascar	0	-0.1	-0.2	-0.1	0.	0.1	-0.1	-0.4	-0.8	-1.2	-1.7	-2.2	-2.5	-2.8	-3.1	-3.3	-3.5	-3.5	-3.4	-3.2	-2.8	-2.4	-2.	-1.4
Mozambique	0	0.5	0.8	1.1	1.2	1.1	0.8	0.4	0.	-0.5	-0.8	-1.2	-1.3	-1.4	-1.4	-1.4	-1.3	-1.5	-1.6	-1.5	-1.3	-1.1	-1.2	-0.7
Uganda	0	0.5	0.9	1.2	1.7	2.2	2.8	3.3	3.6	3.6	3.4	2.9	2.3	1.6	0.9	0.3	-0.2	-0.6	-0.9	-1.1	-1.1	-1.	-1.	-0.6
Senegal	0	0.6	1.5	2.8	> 4	> 5	> 6	> 7	> 8	> 9	8.9	8.2	7.2	6.	4.8	3.6	2.6	1.7	1.	0.5	0.1	-0.1	0.	0.2
Cape Verde	0	0.1	0.5	1.	1.3	1.1	0.2	-1.3	-3.2	-5.1	-6.5	-7.5	-7.8	-7.6	-7.	-6.	-4.9	-3.7	-2.7	-1.7	-1.	-0.3	0.4	1.
Guinea	0	0.1	0.1	0.1	0.	-0.1	-0.2	-0.2	-0.4	-0.5	-0.6	-0.8	-0.9	-1.	-1.	-0.9	-0.8	-0.6	-0.4	-0.1	0.2	0.6	1.	1.4
Gambia	0	-0.4	-0.6	-0.8	-1.	-1.1	-1.2	-1.2	-1.3	-1.3	-1.2	-1.2	-1.1	-1.1	-0.9	-0.8	-0.6	-0.4	-0.1	0.2	0.5	1.	1.4	1.8
Zambia	0	> 1	> 2	> 3	3.7	4.1	4.6	5.	5.4	5.5	5.4	4.9	4.2	3.4	2.8	2.2	1.9	1.8	1.9	2.	2.3	2.2	2.	2.5
Sao Tome & Principe	0	> 1	> 2	2.8	3.3	3.5	3.6	3.5	3.4	3.1	2.8	2.5	2.2	1.9	1.6	1.4	1.3	1.2	1.4	1.5	1.8	2.1	2.4	2.8
Benin	0	-0.1	-0.2	-0.2	-0.1	0.3	0.9	1.5	2.2	2.7	3.	3.1	3.1	2.9	2.6	2.3	2.1	2.	2.1	2.3	2.5	2.8	3.	3.3
Burkina Faso	0	0.9	1.9	2.9	3.8	4.5	5.1	5.5	6.	6.5	7.	7.4	7.6	7.6	7.4	6.9	6.3	5.5	4.8	4.2	3.7	3.5	3.5	3.6
Mali	0	0.4	0.9	1.5	2.2	2.9	3.6	4.2	4.7	5.	4.9	4.7	4.4	3.9	3.4	2.9	2.6	2.4	2.4	2.5	2.7	3.	3.3	3.6
Burundi	0	> 1	> 2	> 3	> 4	4.7	5.1	5.3	5.4	5.3	5.2	5.	4.8	4.4	4.1	3.7	3.4	3.2	3.	3.	3.1	3.2	3.4	3.7
Equatorial Guinea	0	0.1	0.3	0.4	0.6	0.7	0.8	1.	1.2	1.3	1.5	1.8	2.	2.2	2.4	2.7	2.9	3.2	3.5	3.7	4.	4.4	4.7	5.
Congo	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	13.9	11.8	9.9	8.2	6.9	6.2	5.7	5.5
Nigeria	0	0.9	1.8	2.7	3.5	4.2	4.7	5.1	5.3	5.5	5.5	5.6	5.5	5.5	5.5	5.5	5.4	5.4	5.4	5.5	5.6	5.7	5.9	6.2
Guinea-Bissau	0	0.4	0.7	1.1	1.3	1.6	1.8	2.	2.2	2.4	2.7	2.9	3.1	3.3	3.5	3.7	4.	4.3	4.6	4.9	5.2	5.5	5.8	6.2
Togo	0	0.5	1.	1.5	2.	2.4	2.8	3.	3.3	3.5	3.7	3.9	4.1	4.3	4.6	4.9	5.2	5.5	5.7	6.	6.3	6.6	6.9	7.2
Djibouti	0	0.3	0.7	1.2	1.7	2.2	2.7	3.2	3.6	4	4.3	4.6	4.9	5.1	5.2	5.4	5.6	5.8	6.	6.3	6.6	6.8	7.2	7.5
Sierra Leone	0	0.7	1.5	2.2	2.8	3.4	3.8	4.2	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.3	6.6	6.8	7.1	7.4	7.7	8
Gabon	0	0.6	1.3	2.	2.6	3.3	4.	4.7	5.4	6.1	6.7	7.2	7.7	8.	8.2	8.4	8.5	8.5	8.3	8.2	8.2	8.	7.9	8.2
Ghana	0	-0.3	-0.3	0.	0.4	0.9	1.3	1.7	1.9	2.1	2.1	2.2	2.3	2.5	2.9	3.3	4.	4.7	5.4	6.1	6.8	7.4	8.	8.4
Mauritius	0	-1.1	-1.1	-0.1	1.6	3.5	5.4	6.2	5.6	4.3	2.7	1.3	0.6	0.8	1.8	3.	4.3	5.5	6.2	6.7	7.2	7.7	8.2	8.7
Comoros	0	-0.2	-0.3	-0.4	-0.3	-0.1	0.2	0.7	1.3	2	2.8	3.6	4.6	5.5	6.1	6.6	7.	7.3	7.7	7.9	8.1	8.3	8.5	8.8
Cote d'Ivoire	0	1.	2	3	4	5.	6.	6.8	7.5	8.2	8.6	9.	9.2	9.4	9.5	9.5	9.5	9.5	9.4	9.5	9.5	9.8	10.	10.2
Dem Rep of the Congo	0	1	2	3	4	5	6	7	8	9	10.	10.8	11.2	11.2	11	10.7	10.5	10.4	10.3	10.3	10.4	10.4	10.6	10.8
Namibia	0	0.1	0.4	1.	1.8	3.	4.3	5.8	7.5	> 9	> 10	> 11	> 12	> 13	> 14	14.6	13.2	12.5	12.	11.5	10.9	10.3	10.3	10.9
Chad	0	0.6	1.1	1.7	2.3	2.9	3.5	4.1	4.7	5.3	5.8	6.3	6.9	7.4	8.	8.6	9.1	9.6	10.	10.3	10.5	10.8	11.	11.3
Cameroon	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	12.8	12.4	12.1	11.9	11.7	11.5	11.4	11.2	11.2	11.3	11.5
Kenya	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	14.7	14.3	13.9	13.3	13.1	12.7	12.3	12.3	12.4
South Africa	0	0.1	0.5	1.3	2.5	4.3	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	15.2	12.7	12.1	12.5
Angola	0	1.	2	2.9	3.9	4.8	5.7	6.4	7.2	7.8	8.5	9.1	9.7	10.3	10.9	11.5	11.9	12.2	12.4	12.7	12.8	13.	13.2	13.3
Mauritania	0	0.4	1.	1.7	2.6	3.6	4.6	5.6	6.6	7.6	8.5	9.4	10.4	11.2	11.9	12.5	12.9	13.2	13.4	13.6	13.8	13.9	14.1	14.2
Central African Rep	0	0.9	1.8	2.7	3.6	4.6	5.6	6.6	7.6	8.5	9.4	10.3	11.1	11.9	12.6	13.3	13.8	14.3	14.6	14.8	14.9	14.8	14.8	15.
Somalia	0	0.4	1.	1.8	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.7	11.7	12.7	13.7	14.6	15.2	15.5	15.6	15.7	15.8	15.8	15.9
Seychelles	0	-0.4	-0.3	-0.4	-0.1	0.5	1	1.8	2.8	3.8	4.8	6	7	8	9	9.8	10.8	11.8	12.8	13.8	15	16	17	17.8
Botswana	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	20.7	20.8
Lesotho	0	0.8	1.9	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22	> 23
Swaziland	0	1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22	> 23
Zimbabwe	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22	> 23

TABLE 10 (continued) Results of S-time-distance monitoring of MDGs for Under-five mortality rate

Countries \ Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Latin America and the Caribbean																								
Peru	0	-1.	-2.1	-3.1	-4.2	-5.2	-6.2	-7.	-7.8	-8.4	-8.8	-9.2	-9.4	-9.6	-9.6	-9.5	TA	TA	TA	TA	TA	TA	TA	TA
Brazil	0	-0.6	-1.3	-2.1	-3.	-3.8	-4.7	-5.5	-6.3	-6.9	-7.4	-7.8	-8.2	-8.4	-8.5	-8.5	-8.5	TA	TA	TA	TA	TA	TA	TA
El Salvador	0	-1.	-1.8	-2.7	-3.5	-4.3	-5.1	-5.8	-6.4	-6.8	-7.1	-7.3	-7.5	-7.6	-7.6	-7.6	-7.6	-7.5	TA	TA	TA	TA	TA	TA
Bolivia	0	-0.4	-0.8	-1.2	-1.5	-1.9	-2.3	-2.7	-3.1	-3.4	-3.8	-4.2	-4.5	-4.7	-4.8	-4.9	-4.9	-4.9	-4.7	-4.4	-4.1	-3.6	TA	TA
Mexico	0	-0.9	-1.9	-2.7	-3.5	-4.2	-4.9	-5.5	-6.1	-6.4	-6.8	-7.1	-7.2	-7.2	-7.	-6.7	-6.2	-5.6	-5.	-4.4	-3.9	-3.6	TA	TA
Nicaragua	0	-0.6	-1.2	-1.8	-2.3	-2.9	-3.4	-3.9	-4.3	-4.6	-4.9	-5.1	-5.1	-5.	-4.9	-4.7	-4.4	-4.1	-3.7	-3.3	-2.9	-2.4	-1.9	-1.3
Saint Kitts and Nevis	0	-0.8	-1.4	-2	-2.5	-2.9	-3.2	-3.7	-4.	-4.3	-4.5	-4.8	-4.8	-4.8	-4.7	-4.5	-4.3	-3.9	-3.5	-3.1	-2.6	-2.2	-1.6	-1.1
Antigua and Barbuda	0	-0.9	-1.7	-2.3	-2.9	-3.4	-3.9	-4.2	-4.5	-4.7	-4.9	-4.9	-4.8	-4.7	-4.5	-4.3	-4	-3.7	-3.3	-2.9	-2.4	-1.9	-1.4	-0.8
Honduras	0	-0.7	-1.3	-1.8	-2.2	-2.5	-2.7	-2.9	-3.	-3.2	-3.3	-3.3	-3.3	-3.3	-3.2	-3.	-2.9	-2.6	-2.4	-2.1	-1.7	-1.3	-0.9	-0.4
Guatemala	0	-0.8	-1.5	-2.1	-2.7	-3.1	-3.4	-3.7	-3.8	-3.9	-3.9	-3.8	-3.8	-3.6	-3.5	-3.2	-3.	-2.7	-2.3	-1.9	-1.5	-1.1	-0.6	-0.1
Ecuador	0	-0.8	-1.6	-2.3	-3.	-3.6	-4.1	-4.5	-4.7	-4.8	-4.9	-4.8	-4.6	-4.3	-3.9	-3.5	-3.1	-2.6	-2.2	-1.7	-1.2	-0.8	-0.3	0.3
Belize	0	-1.3	-2.3	-3.1	-3.6	-3.9	-4.	-4.1	-4.	-3.9	-3.7	-3.5	-3.3	-2.9	-2.5	-2.1	-1.7	-1.4	-0.9	-0.6	-0.2	0.3	0.8	1.3
Chile	0	-1.8	-3.3	-4.9	-6.	-6.8	-7.	-6.6	-6.1	-5.9	-6.1	-6.3	-6.3	-5.9	-5.2	-4.6	-3.8	-3.	-2.	-1.2	-0.4	0.4	1.	1.6
Cuba	0	-1.5	-2.5	-2.9	-2.8	-2.1	-1.9	-2.3	-3	-3.7	-3.8	-3.9	-3.8	-3.6	-3.5	-3.3	-3.2	-2.7	-1.7	-0.2	1.7	3.	3.1	3.
Dominican Republic	0	-0.4	-0.8	-1.2	-1.5	-1.7	-1.8	-1.9	-1.9	-1.8	-1.7	-1.4	-1.2	-0.9	-0.6	-0.3	0.2	0.5	1.	1.4	1.8	2.3	2.7	3.2
Paraguay	0	-0.2	-0.5	-0.7	-0.8	-0.8	-0.8	-0.7	-0.6	-0.4	-0.3	-0.1	0.1	0.3	0.4	0.6	0.9	1.2	1.4	1.8	2.1	2.5	2.9	3.3
Suriname	0	0.	0.	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.1	-0.1	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.6	3.1	3.4
Colombia	0	-0.1	-0.1	-0.3	-0.4	-0.5	-0.7	-0.8	-0.8	-0.8	-0.8	-0.6	-0.4	-0.1	0.3	0.5	0.9	1.2	1.6	2.	2.3	2.7	3.	3.5
Uruguay	0	-0.3	-0.1	0.2	0.8	0.9	1.	0.7	0.2	-0.1	-0.2	0.	0.2	0.3	0.5	0.7	0.9	1.1	1.6	2.1	2.5	3.	3.3	3.5
Argentina	0	-0.4	-0.6	-0.7	-0.8	-0.7	-0.7	-0.6	-0.4	-0.2	-0.1	0.3	0.6	0.8	0.8	0.7	0.8	1.	1.4	1.9	2.3	2.8	3.1	3.6
Haiti	0	-0.1	-0.1	-0.2	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5	-0.4	-0.3	-0.1	0.1	0.4	0.8	1.2	1.6	2.1	2.5	> 20	3.5	4.	4.4
Venezuela R.B.	0	-0.3	-0.2	0.2	0.6	0.7	0.5	0.3	-0.1	-0.4	-0.4	-0.2	0.2	0.5	0.8	0.9	1	1.4	1.7	2.2	2.8	3.5	4.	4.4
Grenada	0	-0.4	-0.7	-0.9	-1.2	-1.4	-1.4	-1.5	-1.3	-1.	-0.6	-0.3	0.2	0.7	1.2	1.8	2.3	2.8	3.3	3.8	4.1	4.6	5.1	5.4
Bahamas	0	-0.6	-1.2	-1.6	-2.1	-2.7	-2.9	-3.2	-3.2	-2.8	-2.3	-1.6	-0.6	0.2	1.1	1.9	2.6	3.3	3.8	4.3	4.7	5.2	5.7	6.1
Jamaica	0	0.1	0.1	0.2	0.4	0.7	1.	1.3	1.7	2.1	2.3	2.7	3.1	3.4	3.7	4.1	4.3	4.7	4.9	5.2	5.5	5.9	6.1	6.4
Costa Rica	0	0.3	0.5	0.6	0.7	1.5	2.	2.3	2.2	2.1	1.6	0.8	0.2	-0.3	0.	0.6	1.6	2.6	3.1	3.9	4.7	5.7	6.3	6.8
Panama	0	0.	0.2	0.6	1.	1.5	2.	2.5	3.1	3.5	3.9	4.	4.3	4.6	4.7	5.	5.3	5.4	5.7	6.	6.3	6.5	6.8	7.1
Guyana	0	0.1	0.2	0.3	0.5	0.7	1.	1.3	1.6	2.	2.3	2.7	3.2	3.6	4.1	4.7	5.2	5.7	6.2	6.5	6.9	7.2	7.5	7.9
Saint Lucia	0	0.2	0.3	0.5	0.7	0.9	0.9	1.	1.4	1.7	2.2	2.7	3.4	4.2	4.9	5.7	6.4	6.9	7.4	7.9	8.4	8.7	9.2	9.6
Dominica	0	> 1	> 2	> 3	> 4	4.8	5.4	5.9	6.3	6.6	7.	7.3	7.4	7.8	8.1	8.2	8.6	8.9	9.1	9.4	9.5	9.9	10.	10.4
Trinidad & Tobago	0	0.4	0.9	1.5	2.3	3.	3.9	4.9	5.8	6.7	7.6	8.4	9.1	9.6	10.1	10.3	10.6	10.8	10.9	11.	11.2	11.3	11.3	11.6
St Vincent & Grenadines	0	-0.5	-0.4	-0.2	0.4	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.1	9.1	9.9	10.8	11.6	12.3	12.8	13.2	13.6	13.9	14.1	14.4
Barbados	0	-0.5	-0.7	-0.7	-0.4	0.2	1.2	2.4	3.7	5.1	6.5	7.7	8.9	9.7	10.1	10.7	11.	11.4	11.8	12.6	13.2	14.	14.8	15.3
Eastern Asia																								
China	0	0.7	1.	1.1	0.9	0.6	0.2	-0.2	-0.6	-1.2	-1.8	-2.6	-3.5	-4.4	-5.2	-5.9	-6.3	-6.6	-6.7	TA	TA	TA	TA	TA
Mongolia	0	-0.7	-1.3	-1.9	-2.4	-2.8	-3.3	-3.7	-4.2	-4.6	-5.1	-5.5	-5.8	-6.1	-6.3	-6.4	-6.4	-6.2	-6.	-5.6	TA	TA	TA	TA
Korea, Rep	0	-0.6	-1.7	-2.3	-2.9	-3.5	-3.5	-2.5	-1.	1.6	4.7	7.3	8.8	9.3	8.2	7.1	6.	4.9	4.3	4.2	4.2	4.6	5.1	5.
Korea, Dem People's Rep	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	8.9	6.5	5.8	6.3	7.5	8.5	9.2	9.5	9.5	9.3	9.2
Southern Asia																								
Maldives	0	-0.8	-1.7	-2.6	-3.5	-4.5	-5.5	-6.6	-7.7	-8.8	-9.9	-11.	-11.9	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Bhutan	0	-0.7	-1.3	-1.9	-2.5	-3.1	-3.6	-4.1	-4.5	-4.9	-5.2	-5.5	-5.7	-5.9	-6	-6.1	-6.1	-6.1	-6.	-5.8	TA	TA	TA	TA
Nepal	0	-0.8	-1.7	-2.4	-3.1	-3.7	-4.2	-4.7	-5.2	-5.6	-5.9	-6.2	-6.4	-6.6	-6.6	-6.6	-6.6	-6.4	-6.2	-5.9	TA	TA	TA	TA
Bangladesh	0	-0.6	-1.1	-1.7	-2.2	-2.7	-3.2	-3.6	-4.	-4.3	-4.5	-4.7	-4.8	-4.9	-5	-5.	-5.1	-5.	-5.	-4.9	-4.7	TA	TA	TA
Iran (Islamic Rep)	0	-0.8	-1.5	-2.	-2.4	-2.7	-3.	-3.3	-3.7	-4.1	-4.5	-4.8	-5.	-5.2	-5.4	-5.4	-5.4	-5.4	-5.3	-5.1	-4.8	TA	TA	TA
India	0	0.	-0.1	0.	-0.1	0.	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	0.	0.1	0.2	0.4	0.6	0.9	1.2
Sri Lanka	0	0.8	1.8	2.7	3.1	3.1	2.8	2.4	2.	1.6	1.2	1.	1.1	1.2	1.3	1.6	1.4	1.2	1.1	1.2	1.3	1.6	2.1	2.4
Afghanistan	0	-0.6	-1.	-1.3	-1.4	-1.3	-1.	-0.6	-0.1	0.4	0.9	1.3	1.6	1.9	2.1	2.4	2.8	3.1	3.6	4.1	4.5	5.	5.4	5.9
Pakistan	0	0.3	0.7	0.9	1.3	1.6	1.8	2.1	2.4	2.7	3.	3.3	3.7	4.	4.5	4.9	5.4	5.9	6.4	6.8	7.3	7.8	8.3	8.6

TABLE 10 (continued) Results of S-time-distance monitoring of MDGs for Under-five mortality rate

Countries \ Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
South-Eastern Asia																								
Timor-Leste	0	-0.6	-1.2	-1.7	-2.2	-2.6	-3.	-3.4	-3.7	-4.	-4.3	-4.5	-4.7	-4.9	-5.	-5.	-5.1	-4.9	-4.8	-4.5	-4.1	-3.6	TA	TA
Cambodia	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	7.8	5.7	3.1	0.8	-1	-2.2	-3.	-3.5	-3.7	-3.7	-3.5	-3.2	-2.8	TA
Indonesia	0	-0.7	-1.3	-1.9	-2.5	-3.	-3.3	-3.7	-3.9	-4.2	-4.3	-4.4	-4.4	-4.3	-4.2	-4.1	-3.9	-3.6	-3.4	-3.1	-2.7	-2.4	-1.9	-1.5
Thailand	0	-1.	-1.9	-2.7	-3.3	-3.8	-4.1	-4.3	-4.5	-4.7	-4.8	-4.8	-4.8	-4.8	-4.7	-4.5	-4.3	-4.	-3.7	-3.3	-2.8	-2.4	-1.9	-1.3
Singapore	0	-2.9	-4.8	-6.3	-7.2	-7.2	-7.2	-7.1	-7.6	-7.6	-8.	-8.5	-8.9	-8.9	-8.9	-8.4	-7.4	-6.4	-5.9	-4.9	-3.9	-2.9	-1.9	-0.9
Lao People's Dem Rep	0	0.	0.	0.	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	0.1	0.3	0.5	0.7	0.9	1.3	1.6	2.
Myanmar	0	0.	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.2	1.5	1.9	2.2	2.5	2.9
Viet Nam	0	-0.5	-0.8	-1.2	-1.4	-1.6	-1.7	-1.8	-1.7	-1.7	-1.5	-1.3	-1.1	-0.9	-0.5	-0.3	0.1	0.5	0.9	1.3	1.7	2.2	2.7	3.1
Philippines	0	-1.1	-2.	-2.6	-2.9	-3.1	-3.1	-3.	-2.8	-2.4	-2.	-1.5	-1.1	-0.6	-0.1	0.4	0.9	1.5	1.9	2.5	3.	3.6	4.1	4.6
Malaysia	0	-0.8	-1.4	-2.	-2.1	-2.5	-2.4	-2.5	-2.8	-3.7	-4.7	-5.	-5.4	-5.3	-4.8	-4.	-3.2	-2.2	-1.	0.3	1.7	2.7	3.7	4.7
Brunei Darussalam	0	0.1	0.2	0.2	0	0.1	0.2	0.2	0.6	1.	1.7	2.1	3.1	3.8	4.5	5.2	6.2	7.2	8.2	9.5	11.1	12.4	14.3	15.9
Western Asia																								
Oman	0	-2.5	-4.7	-6.5	-8.	-9.2	-10.1	-10.8	-11.3	-11.5	-11.8	-11.7	-11.6	-11.3	-10.9	TA	TA	TA	TA	TA	TA	TA	TA	TA
Turkey	0	-1.	-2.	-2.9	-3.6	-4.2	-4.8	-5.4	-5.8	-6.2	-6.5	-6.7	-6.9	-7.	-7.	-6.9	-6.8	-6.7	-6.5	TA	TA	TA	TA	TA
Lebanon	0	-0.7	-1.4	-1.9	-2.3	-2.7	-3.1	-3.3	-3.6	-4	-4.3	-4.7	-5.	-5.3	-5.6	-6.	-6.2	-6.2	-6.2	-5.9	TA	TA	TA	TA
Bahrain	0	0.4	0.2	-0.4	-1.5	-3.	-4.4	-5.6	-6.4	-6.8	-6.8	-6.6	-6.1	-5.6	-5.1	-4.7	-4.5	-4.4	-4.5	-4.6	-4.8	TA	TA	TA
Saudi Arabia	0	-2.4	-4.2	-5.7	-6.7	-7.5	-8.	-8.3	-8.4	-8.4	-8.1	-7.9	-7.5	-7.	-6.4	-5.8	-5.2	-4.6	-4.	-3.5	-3.	-2.4	-1.8	-1.3
Syrian Arab Republic	0	-0.7	-1.3	-1.8	-2.4	-2.8	-3.2	-3.5	-3.7	-3.8	-4.	-4.	-3.9	-3.9	-3.7	-3.6	-3.4	-3.2	-2.9	-2.6	-2.2	-1.4	-0.3	0.2
Qatar	0	-1.3	-2.7	-3.7	-4.5	-4.9	-5.2	-5.3	-5.3	-5.2	-5.1	-5.1	-4.8	-4.5	-4.2	-3.8	-3.3	-2.8	-2.4	-1.9	-1.3	-0.8	-0.4	0.3
Yemen	0	-0.1	0.1	0.3	0.5	0.9	1.3	1.5	1.6	1.5	1.3	1.	0.7	0.4	0.2	0.1	0.	-0.1	0.	0.	0.2	0.4	0.6	0.9
United Arab Emirates	0	-0.8	-1.6	-2.2	-2.6	-2.7	-2.6	-2.8	-2.7	-2.4	-2.1	-1.7	-1.4	-1.1	-0.8	-0.2	0.3	0.9	1.4	2.	2.5	3.3	3.8	4.1
State of Palestine	0	-0.8	-1.4	-1.8	-2.	-2.1	-2.1	-2.1	-1.9	-1.7	-1.4	-1.	-0.6	-0.1	0.3	0.7	1.2	1.7	2.2	2.7	3.1	3.5	3.9	4.3
Jordan	0	-0.2	-0.3	-0.3	-0.2	0.	0.1	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.6	1.9	2.1	2.4	2.8	3.1	3.5	3.8	4.2	4.6
Kuwait	0	-1.	-1.4	-1.3	-0.7	-0.4	0.2	0.3	0.6	0.7	1.	1.6	2.1	2.7	3.2	3.8	4.6	5.3	5.9	6.4	6.8	6.9	6.7	6.8
Iraq	0	0.3	0.6	1.	1.4	1.8	2.2	2.7	3.	3.4	3.8	4.3	4.7	5.2	5.7	6.2	6.7	7.1	7.5	7.9	8.3	8.6	9.1	9.4
Oceania																								
Cook Islands	0	0.4	0.8	1.2	1.1	1	0.5	-0.1	-0.8	-1.3	-1.7	-1.9	-2.1	-2.4	-2.4	-2.7	-2.8	-2.8	-2.8	-2.5	-2.3	-1.9	-1.5	-1.
Palau	0	0.	-0.1	0.	-0.1	0.	0.	0.	0.1	0.2	0.2	0.4	0.6	0.7	0.9	1.2	1.4	1.6	2	2.3	2.6	2.9	3.3	3.7
Vanuatu	0	-0.9	-1.6	-2.	-2.2	-2.3	-2.3	-2.1	-1.9	-1.7	-1.3	-1.1	-0.7	-0.3	0.4	1.	1.6	2.2	2.6	3.	3.5	3.9	4.3	4.7
Tuvalu	0	0.5	0.8	0.9	1.	1.1	0.9	0.7	0.5	0.4	0.4	0.5	0.6	1.	1.3	1.7	2.1	2.4	2.8	3.2	3.5	3.9	4.3	4.7
Tonga	0	-0.3	-0.6	-0.6	-0.4	-0.3	0.2	0.8	1.1	1.6	1.9	2.3	2.5	2.6	2.8	3.2	3.3	3.7	4.	4.2	4.4	4.7	5.1	5.4
Samoa	0	-0.2	-0.5	-0.8	-1.	-1.2	-1.3	-1.4	-1.3	-1.3	-1.1	-1.	-0.7	-0.3	0.3	1.	1.7	2.5	3.2	4.1	5	5.9	6.8	7.4
Kiribati	0	-0.4	-0.7	-0.8	-0.7	-0.5	-0.4	-0.2	-0.1	0.2	0.4	0.8	1.2	1.8	2.5	3.3	4.2	5.1	5.9	6.5	7.1	7.5	8.	8.4
Nauru	0	-0.3	-0.5	-0.7	-0.8	-0.9	-1.	-1.	-0.9	-0.8	-0.6	-0.2	0.3	0.9	1.7	2.7	3.7	4.9	6.1	7	7.8	8.4	8.9	9.4
Micronesia (Fed States)	0	0.7	1.7	2.7	3.8	4.9	6	7	7.7	8.2	8.4	8.7	8.8	9.	9.	9.1	9.2	9.4	9.5	9.5	9.7	9.8	10.	10.1
Papua New Guinea	0	0.4	0.8	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.2	6.9	7.6	8.3	8.9	9.4	9.7	10.1	10.3	10.6	10.8	11.1	11.3
Marshall Islands	0	-0.5	-0.8	-1.	-1.	-0.6	0.1	0.9	1.9	2.9	3.9	4.8	5.7	6.5	7.3	8.	8.8	9.6	10.4	11.2	12.	12.8	13.4	13.9
Solomon Islands	0	0.1	0.4	0.5	0.8	1.2	1.8	2.6	3.6	4.7	5.8	7.	8.2	9.5	10.7	11.7	12.5	13.1	13.5	13.9	14.1	14.4	14.5	14.7
Fiji	0	-0.3	-0.4	-0.3	0	0.5	0.9	1.4	1.9	2.5	3	3.5	4	4.6	5.4	6.3	7.4	8.5	9.8	11	12.1	13.3	14.3	15
Niue	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22	> 23

SOURCE: Own calculations based on data from UN (2015a).

Proportion of population using an improved drinking water source, total for 154 countries

The implementation of this MDG target (halve the proportion of people without access to improved drinking water source) showed better results. Figure 34 already visually indicates the large number of countries (more than one half) that already reached their 2015 targets at around 2012. Also the number of countries where no progress from the starting point was observed is considerably lower than for the under-five mortality rate.

Table 11 shows that in all world regions countries with 'Target achieved' sign are prevailing, with the exception of Sub-Saharan Africa, though there were still 16 countries which achieved this and 5 more were ahead of their line to the 2015 target.

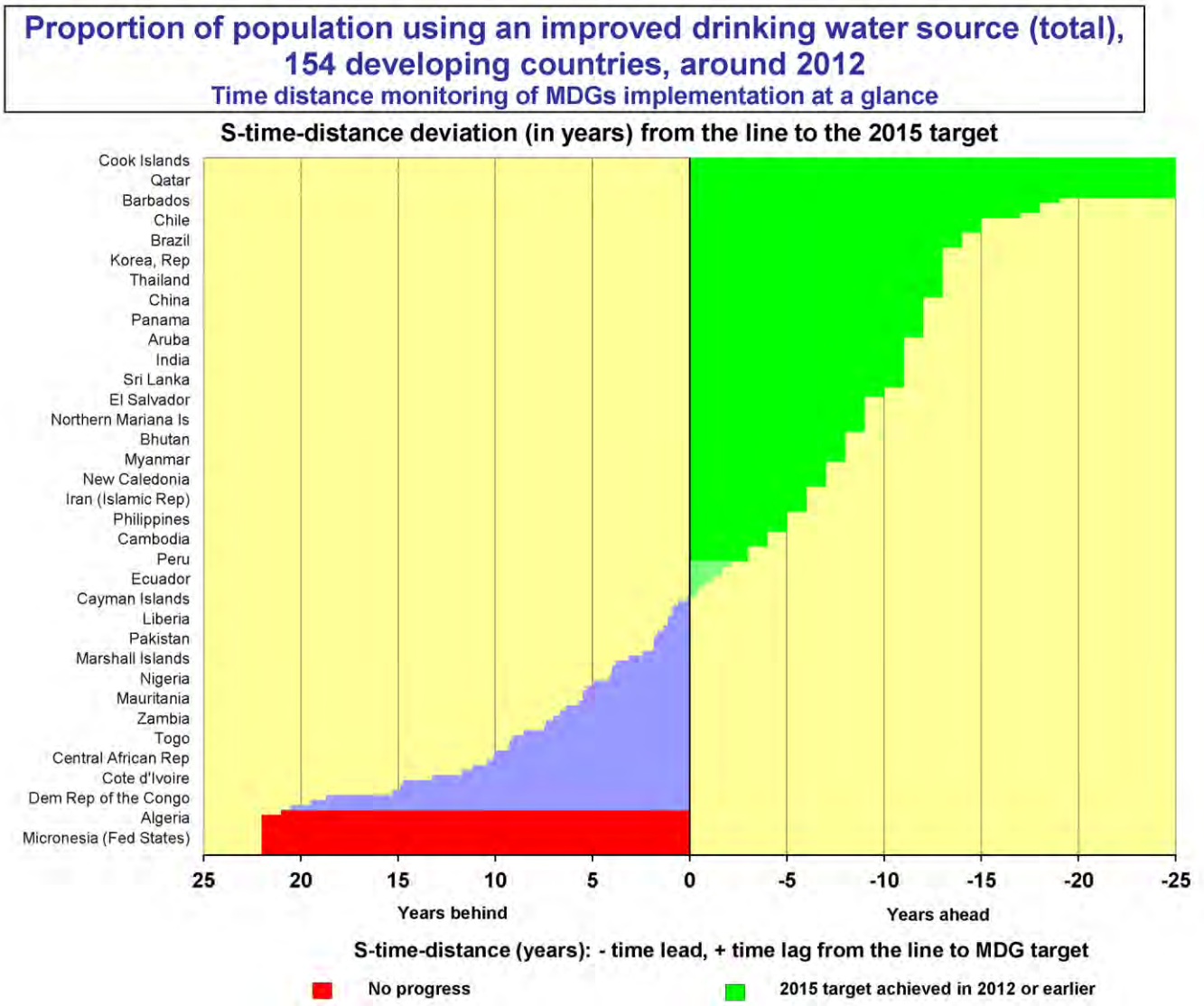


FIGURE 34 S-Time-Distance monitoring MDGs for indicator Proportion of population using an improved drinking water source, total in 2012 (or latest available year)
SOURCE: Own calculations based on data from UN (2015a).

With results from a large number of countries the experts and the civil society can look into details of policies and actions taken or not taken to change the situation. For 13 counties we left the rows empty as their values were constant throughout the period, for some of them even at a high value, so that very small expected changes would exaggerate the time delay calculated. Furthermore, the quality of country data in the databases may need improvements.

On the whole, improvements in the share of population with respect to drinking water sources is one of the MDG indicators with good success, which needs to be continued and expanded on the many country levels. Comparing with another similar indicator, Proportion of population using an improved sanitation facility, it shows much greater improvements contributing also to improvements in several health indicators.

TABLE 11 Results of S-time-distance monitoring of MDGs for Proportion of population using an improved drinking water source, total

S-time-distance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Northern Africa																							
Egypt	0	1	-5.2	-4.2	-3.2	-9.4	-8.4	-7.4	-6.4	-12.5	-11.5	-10.5	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Tunisia	0	1	-0.9	-2.8	-4.6	-6.4	-8.2	-7.2	-9.	-10.7	-9.7	-11.4	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Morocco	0	1	0	-1.	0.	-0.9	0.1	-0.9	0.1	-0.8	0.2	-0.6	0.4	-0.5	0.5	1.5	0.7	1.7	0.9	1.9	1.1	2.1	1.3
Libya																							
Algeria	0	1	2	3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22
Sub-Saharan Africa																							
Comoros	0	-3.	-2.	-4.9	-3.9	-6.8	-5.8	-8.6	-7.6	-10.4	-9.4	-12.1	-11.1	TA	TA	TA	TA	TA	TA	TA	TA		
Botswana	0	-5.4	-4.4	-3.4	-2.4	-7.6	-6.6	-5.6	-4.6	-9.9	-8.9	-7.9	-6.9	-5.9	TA	TA	TA	TA	TA	TA	TA	TA	TA
Ghana	0	-1.6	-3.	-4.4	-4.6	-5.9	-6.	-7.1	-8.2	-8.3	-9.3	-9.3	-10.2	-10.1	TA	TA	TA	TA	TA	TA	TA	TA	TA
Namibia	0	-0.7	-3.	-3.6	-4.2	-4.7	-5.3	-7.3	-7.8	-8.3	-8.7	-9.1	-9.6	-9.9	TA	TA	TA	TA	TA	TA	TA	TA	TA
Malawi	0	-1.2	-2.3	-3.4	-4.3	-6.1	-6.8	-7.5	-8.2	-8.8	-8.5	-9.1	-9.5	-9.9	-10.3	TA	TA	TA	TA	TA	TA	TA	TA
Sao Tome & Principe					0	1	2	3	2.3	1.5	-0.8	-3.1	-5.3	-7.5	-8.	TA	TA	TA	TA	TA	TA	TA	TA
Mauritius	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TA	TA	TA	TA	TA	TA	TA
South Africa	0	1	-0.8	0.2	1.2	-0.5	-2.2	-1.2	-2.9	-4.5	-6.1	-7.7	-6.7	-8.2	-9.8	-8.8	TA	TA	TA	TA	TA	TA	TA
Burkina Faso	0	1	0.9	-0.4	-1.5	-2.5	-2.5	-3.4	-4.2	-5.	-5.7	-6.4	-7.	-6.8	-7.3	-7.8	-8.3	TA	TA	TA	TA	TA	TA
Djibouti	0	1	2	3	4	2.7	1.4	0.1	1.1	-0.1	-1.3	-2.5	-3.6	-4.8	-5.9	-6.9	-8.	TA	TA	TA	TA	TA	TA
Gabon					0	-1.1	-2.2	-1.2	-2.3	-3.3	-4.3	-5.3	-6.3	-5.3	-6.2	-7.2	-8.1	-7.1	TA	TA	TA	TA	TA
Gambia	0	-1.2	-0.2	-1.4	-2.6	-1.6	-2.8	-3.9	-2.9	-4.	-5.	-4.	-5.1	-6.1	-5.1	-6.1	-7.1	-6.1	TA	TA	TA	TA	TA
Guinea-Bissau	0	-0.1	-1.1	-1.1	-2.1	-2.9	-2.8	-3.5	-4.1	-3.9	-4.5	-4.9	-4.7	-5.1	-5.4	-5.7	-5.4	-5.6	-5.8	TA	TA	TA	TA
Mali	0	-1.1	-2.	-2.	-2.8	-3.4	-3.2	-3.8	-4.3	-4.7	-4.3	-4.7	-4.9	-5.1	-5.3	-4.9	-5.	-5.	-5.1	-5.	TA	TA	TA
Swaziland	0	1	2	3	1.8	0.8	-0.2	-0.1	-1.	-1.8	-2.5	-3.1	-3.7	-3.4	-3.9	-4.4	-4.8	-5.1	-5.4	-5.1	TA	TA	TA
Uganda	0	-0.1	-1.3	-1.3	-2.4	-2.3	-3.2	-3.2	-4.	-3.8	-3.7	-4.4	-4.2	-4.8	-5.3	-5.1	-5.5	-5.2	-5.6	-5.3	TA	TA	TA
Guinea	0	-0.3	-0.5	-1.9	-2.1	-2.2	-2.3	-2.4	-2.5	-2.6	-2.6	-2.7	-2.7	-2.7	-2.7	-2.7	-2.6	-2.6	-2.5	-2.4	-2.4	-2.2	-2.1
Cameroon	0	-0.2	-0.5	-0.6	-0.8	-2.1	-2.2	-2.3	-2.4	-2.4	-2.4	-2.5	-2.5	-2.5	-2.4	-2.4	-2.3	-2.3	-2.2	-2.1	-2.	-1.9	-1.7
Ethiopia	0	1	0.7	-0.5	-1.5	-1.5	-2.2	-2.7	-3.1	-3.4	-3.7	-3.8	-3.9	-3.9	-3.8	-3.3	-3.1	-3.	-2.7	-2.5	-2.2	-1.9	-1.6
Cape Verde			0	1	2	0.6	1.6	2.6	1.2	2.2	0.8	1.8	0.5	1.5	0.2	1.2	-0.1	0.9	-0.4	-1.6	-0.6	-1.8	-0.8
Benin	0	-0.4	-0.7	-1.	-1.3	-1.6	-1.8	-0.8	-1.1	-1.3	-1.5	-1.6	-1.8	-1.9	-2.1	-2.2	-2.3	-1.3	-1.3	-1.4	-1.4	-1.5	-0.5
Liberia					0	1	2	3	4	3.8	3.7	3.5	3.4	2.2	2.1	2.1	2	2.	2.	2.	2.	2.	1.1
Eritrea	0	1	2	3	2.9	1.7	1.6	0.6	-0.4	-0.3	-1.2	-1.1	-1.9	-1.7	-2.4	-1.4	-0.4	0.6	1.6				
Sierra Leone	0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	0.	0.1	0.2	0.3	0.4	0.6	0.8	1.	0.4	0.7	0.9	1.2	1.5	1.8	2.1	2.4
Senegal	0	-0.4	0.6	0.2	-0.2	0.8	0.4	1.4	1.	0.7	1.7	1.4	1.1	2.1	1.9	1.6	2.6	2.4	3.4	3.2	3.	4.	3.8
Kenya	0	-0.1	-0.2	-0.3	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	1.8	1.9	2.	2.1	2.3	2.5	3.5	3.6	3.8	4.
Nigeria	0	-0.2	-0.3	-0.4	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	1.4	1.5	1.5	1.6	2.6	2.7	2.8	3.	4.	4.1
Madagascar	0	-0.1	-0.1	-0.1	0.	0.	0.1	1.1	1.2	1.4	1.6	1.7	1.9	2.2	2.4	2.7	3.	3.3	3.6	3.9	4.2	4.6	5.
Mauritania	0	-0.1	-0.1	-0.1	-0.1	0.	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.2	1.5	1.8	2.1	2.5	3.5	4.5	5.5
Niger	0	-0.1	-0.1	-0.1	0.9	0.9	0.9	1.	1.1	2.1	2.2	2.4	2.5	2.7	3.7	3.9	4.1	4.3	4.5	4.8	5.1	6.1	6.3
Congo								0	-0.2	0.8	1.8	2.8	2.5	2.3	3.3	3.1	4.1	4.	5.	4.8	5.8	5.7	6.7
Zambia	0	1	0.8	1.8	1.6	2.6	3.6	3.5	4.5	4.3	5.3	5.2	5.1	5.	5.	6.	5.9	5.9	5.9	5.9	6.	6	7
Rwanda	0	-0.4	0.6	0.2	1.2	0.8	0.4	1.4	1.	0.7	1.7	1.4	2.4	2.1	3.1	4.1	3.9	4.9	5.9	5.6	6.6	7.6	7.4
Mozambique	0	1	0.9	1.9	1.9	1.9	1.9	1.9	2.	3.	3.1	3.2	4.2	4.4	4.5	5.5	5.7	5.9	6.9	7.1	7.3	7.5	8.5
Togo	0	-0.2	0.8	0.6	1.6	1.5	2.5	2.4	3.4	3.3	4.3	4.2	5.2	5.1	6.1	6.1	6.1	7.1	7.1	8.1	8.1	9.1	9.1
Somalia				0	1	2	3	4	4.	4.1	5.1	5.2	5.4	5.6	5.8	6.	6.3	5.9	6.9	7.9	8.9	9.3	
Angola	0	1	2	3	2.9	3.9	3.8	4.8	4.7	5.7	5.7	6.7	6.7	7.7	7.6	7.7	8.7	8.7	8.8	8.8	8.9	9.9	10.
Central African Rep	0	1	2	3	2.6	3.6	3.2	4.2	3.8	4.8	5.8	5.5	6.5	6.2	7.2	6.9	7.9	7.6	8.6	8.3	9.3	9.1	10.1
Chad	0	1	0.9	1.9	1.8	2.8	2.8	3.8	3.7	4.7	4.7	5.7	5.8	6.8	6.8	7.8	7.9	8.9	8.9	9.9	10.	11.	11.2
Burundi	0	1	2	1.2	2.2	3.2	2.5	3.5	4.5	3.8	4.8	5.8	6.8	6.1	7.1	8.1	7.4	8.4	9.4	10.4	9.7	10.7	11.7
Equatorial Guinea																							
Cote d'Ivoire	0	1	2	3	1.8	2.8	3.8	4.8	5.8	6.8	5.6	6.6	7.6	8.6	9.6	8.4	9.4	10.4	11.4	12.4	11.3	12.3	13.3
Lesotho	0	1	2	3	4	5	6	4.6	5.6	6.6	7.6	8.6	9.6	8.2	9.2	10.2	11.2	12.2	10.9	11.9	12.9	13.9	14.9
Dem Rep of the Congo	0	1	2	3	4	5	6	5.9	6.9	7.9	8.9	9.9	10.9	11.9	11.8	12.8	13.8	14.8	14.7	15.7	16.7	17.7	18.7
Zimbabwe	0	1	2	3	4	5	6	7	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5
Réunion																							
Seychelles																							
Sudan	0	-0.7	2	3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22
U. Rep of Tanzania	0	1	2	3	4	5	6	7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22

TABLE 11 (continued) Results of S-time-distance monitoring of MDGs for Proportion of population using an improved drinking water source, total

S-time-distance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Latin America and the Caribbean																							
US Virgin Islands	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Barbados	0	-9.1	-8.1	-17.1	-16.1	-15.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Chile	0	-4.1	-3.1	-7.2	-6.2	-10.2	-9.2	-13.1	-12.1	-11.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Montserrat	0	1	2	-13.7	-12.7	-11.7	-10.7	-9.7	-8.7	-7.7	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Argentina	0	1	2	-5.4	-4.4	-3.4	-2.4	-9.8	-8.8	-7.8	-6.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Brazil	0	-3.3	-6.5	-5.5	-8.7	-7.7	-10.9	-9.9	-13.	-12.	-11.	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
St Vincent & Grenadines	0	-3.3	-2.3	-5.5	-4.5	-7.7	-6.7	-9.9	-8.9	-12.	-11.	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Belize	0	-1	-2.	-4.9	-5.8	-6.6	-7.5	-8.3	-10.9	-11.7	-12.4	-13.2	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Martinique			0	1	2	3	> 4	2.3	-1.9	-3.5	-7.6	-9.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Paraguay	0	-1.5	-3.	-5.5	-6.7	-7.9	-8.9	-10.	-11.	-11.9	-11.8	-12.7	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Uruguay	0	-9.1	-8.1	-7.1	-6.1	-5.1	-4.1	-13.1	-12.1	-11.1	-10.1	-9.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Guyana	0	1	-0.3	-1.6	-2.9	-4.1	-5.3	-6.5	-7.6	-8.8	-9.9	-10.9	-12.	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Panama	0	-2.3	-1.3	-3.5	-5.6	-4.6	-6.8	-8.9	-7.9	-10.	-9.	-11	-10	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Aruba	0	1	-3.7	-2.7	-1.7	-6.3	-5.3	-4.3	-8.8	-7.8	-6.8	-11.3	-10.3	-9.3	TA	TA	TA	TA	TA	TA	TA	TA	TA
Guadeloupe	0	1	2	3	4	5	6	7	8	9	10	11	12	13	TA	TA	TA	TA	TA	TA	TA	TA	TA
Mexico	0	-1.9	-3.8	-2.8	-4.6	-6.4	-5.4	-7.2	-6.2	-8.	-9.7	-8.7	-10.4	-9.4	TA	TA	TA	TA	TA	TA	TA	TA	TA
El Salvador	0	-1.2	-0.2	-1.3	-2.4	-3.4	-4.5	-5.5	-6.5	-7.4	-8.4	-7.4	-8.3	-9.2	-8.2	-9.1	TA	TA	TA	TA	TA	TA	TA
Guatemala	0	-1.8	-3.5	-2.5	-4.2	-3.2	-4.9	-6.5	-5.5	-7.1	-6.1	-7.7	-9.2	-8.2	-9.8	-8.8	TA	TA	TA	TA	TA	TA	TA
Bahamas				0	1	2	3	4	5	6	-4.1	-3.1	-2.1	-1.1	-0.1	0.9	1.9	TA	TA	TA	TA	TA	TA
Bolivia	0	-0.8	-1.5	-2.3	-3.	-3.6	-4.3	-4.9	-5.5	-6.1	-6.7	-7.3	-7.8	-8.3	-7.3	-7.8	-8.3	TA	TA	TA	TA	TA	TA
Honduras	0	-1	0	-1.	-1.9	-2.9	-3.8	-2.8	-3.6	-4.5	-5.3	-6.1	-5.1	-5.9	-6.7	-7.4	-6.4	-7.2	TA	TA	TA	TA	TA
Suriname					0	1	2	-0.3	0.7	1.7	-0.6	-2.9	-1.9	-4.1	-3.1	-5.3	-4.3	-6.4	-5.4	TA	TA	TA	TA
Costa Rica	0	1	-5.2	-4.2	-3.2	-2.2	-1.2	-7.4	-6.4	-5.4	-4.4	-3.4	-2.4	-1.4	-7.5	-6.5	-5.5	-4.5	-3.5	-2.5	-1.5	-0.5	TA
Peru	0	-1.1	-2.1	-1.1	-2.1	-3.1	-2.1	-3.1	-2.1	-3.	-4.	-3.	-3.9	-2.9	-3.7	-2.7	-3.6	-2.6	-3.4	-2.4	-3.2	-2.2	TA
Ecuador	0	1	-0.1	-1.1	-0.1	-1.1	-0.1	-1.1	-2.1	-1.1	-2.	-1.	-2.	-1.	-1.9	-2.7	-1.7	-2.6	-1.6	-2.4	-1.4	-2.2	-1.2
Cayman Islands				0	1	2	3	4	5	6	7	1.6	2.6	3.6	4.6	-0.7	0.3	1.3	2.3	-2.9	-1.9	-0.9	0.1
Nicaragua	0	1	-0.1	-1.1	-0.1	-1.1	-2.1	-1.1	-2.1	-1.1	-2.	-3.	-2.	-2.9	-1.9	-2.7	-3.6	-2.6	-3.4	-2.4	-1.4	-0.4	0.6
Trinidad & Tobago	0	1	-3.1	-2.1	-1.1	-0.1	0.9	-3.2	-2.2	-1.2	-0.2	0.8	-3.2	-2.2	-1.2	-0.2	0.8	-3.1	-2.1	-1.1	-0.1	0.9	
French Guiana			0	1	2	3	4	5	3.2	4.2	2.4	3.4	1.6	2.6	0.9	1.9	0.2	1.2	-0.5	0.5	-1.1	-0.1	0.9
Cuba					0	1	2	3	4	5	1.7	2.7	3.7	0.5	1.5	2.5	3.5	0.3	1.3	2.3	3.3	0.1	1.1
Venezuela R.B.	0	1	2	-2.1	-1.1	-0.1	0.9	-3.2	-2.2	-1.2	-0.2	0.8	1.8	-2.2	-1.2	-0.2	0.8	1.8					
Antigua and Barbuda	0	1	2	-13.7	-12.7	-11.7	-10.7	-9.7	-8.7	-7.7	-6.7	-5.7	-4.7	-3.7	-2.7	-1.7	-0.7	0.3	1.3	2.3	3.3	4.3	5.3
Anguilla						0	1	2	3	4	5	0.2	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2	9.2	4.5	5.5
Colombia	0	-3.3	-2.3	-1.3	-0.3	0.7	1.7	2.7	-0.5	0.5	1.5	2.5	3.5	4.5	5.5	6.5	3.3	4.3	5.3	6.3	7.3	8.3	9.3
Puerto Rico																							
British Virgin Islands																							
Dominica																							
Turks and Caicos Is																							
Saint Lucia	0	1	2	3	-3.2	-2.2	-1.2	-0.2	0.8	1.8	2.8	3.8	4.8	5.8	6.8	7.8	8.8	9.8	10.8	11.8	12.8	13.8	14.8
Haiti	0	1	0.5	1.5	2.5	5	6	7	8	9	10	11	12	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5
Grenada																							
Jamaica																							
Saint Kitts and Nevis																							
Dominican Republic	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22
Eastern Asia																							
Korea, Rep		0	1	2	3	-0.9	0.1	-3.8	-2.8	-6.6	-5.6	-9.3	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
China	0	-0.7	-3.	-3.6	-4.2	-6.3	-6.8	-7.3	-9.3	-9.7	-10.1	-10.6	-12.3	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Mongolia	0	1	2	3	4	3.5	3.	2.6	2.2	1.8	1.4	-0.4	-2.	-2.3	-2.6	-4.	-4.3	-5.7	-5.8	TA	TA	TA	TA
Korea, Dem People's Rep	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22

TABLE 11 (continued) Results of S-time-distance monitoring of MDGs for Proportion of population using an improved drinking water source, total

S-time-distance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Southern Asia																							
India	0	-0.8	-1.6	-2.4	-3.2	-5.6	-6.3	-6.9	-7.6	-8.2	-8.8	-9.4	-9.9	-10.5	TA	TA	TA	TA	TA	TA	TA	TA	TA
Maldives	0	1	2	3	4	-2.2	-1.2	-0.2	-6.4	-5.4	-4.4	-10.5	-9.5	-8.5	TA	TA	TA	TA	TA	TA	TA	TA	TA
Sri Lanka	0	-0.7	-1.4	-2.1	-2.8	-3.4	-5.6	-6.2	-6.7	-7.2	-7.7	-8.2	-10.2	-10.6	TA	TA	TA	TA	TA	TA	TA	TA	TA
Nepal	0	-2.3	-2.9	-3.4	-4.	-4.5	-5	-5.5	-5.9	-6.4	-6.8	-7.2	-7.6	-8.	-8.3	-8.7	TA	TA	TA	TA	TA	TA	TA
Bhutan								0	1	2	3	4	-0.3	-1.9	-3.5	-5	-6.5	TA	TA	TA	TA	TA	TA
Afghanistan		0	1	2	3	4	0.2	-2.9	-4.2	-5.6	-6.1	-6.8	-6.9	-7.3	-7.1	-7.2	-7.	-6.9	-6.5	TA	TA	TA	TA
Iran (Islamic Rep)	0	1	2	3	-2.4	-1.4	-0.4	0.7	-4.6	-3.6	-2.6	-1.6	-6.9	-5.9	-4.9	-3.9	-2.9	-1.9	-0.9	TA	TA	TA	TA
Bangladesh	0	-0.7	-1.4	-0.4	-1.1	-1.8	-2.4	-3	-2	-2.6	-3.2	-3.7	-4.2	-3.2	-3.7	-4.2	-4.7	-3.7	-4.2	-4.6	-3.6	TA	TA
Pakistan	0	-2.5	-1.5	-0.5	-2.9	-1.9	-0.9	0.1	-2.3	-1.3	-0.3	-2.6	-1.6	-0.6	0.4	-1.9	-0.9	0.1	-2.2	-1.2	-0.2	0.8	1.8
South-Eastern Asia																							
Singapore	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Malaysia	0	-3.3	-6.5	-9.7	-12.9	-11.9	-15.	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Thailand	0	-2.7	-1.7	-4.3	-7.	-6.	-8.5	-7.5	-10.1	-9.1	-11.6	-10.6	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Viet Nam	0	-1.9	-3.7	-4.1	-5.8	-6.1	-7.7	-9.2	-9.4	-10.8	-11.	-12.3	-12.4	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Myanmar	0	1	2	3	2.7	1.1	-0.5	-0.7	-2.1	-2.2	-3.5	-3.7	-4.8	-6.	-6	-7.	-7.	TA	TA	TA	TA	TA	TA
Philippines	0	1	2	-0.3	0.8	-1.5	-0.5	0.5	-1.6	-0.6	-2.8	-1.8	-0.8	-2.9	-1.9	-4.	-3.	-5	-4	-3	TA	TA	TA
Cambodia	0	> 1	> 2	> 3	> 4	2.9	6	4.9	3.	2.2	-1	0	-0.5	-1.7	-2.1	-3.7	-3.3	-4.1	-4.3	-4.9	-4.5	TA	TA
Lao People's Dem Rep					0	1	2	3	3.1	2.3	1.6	0.2	-0.4	-0.8	-2.	-2.3	-2.6	-2.8	-3.1	-3.2	-3.4	TA	TA
Indonesia	0	-0.8	0.2	-0.6	-1.4	-2.2	-2.9	-1.9	-2.6	-3.3	-3.9	-2.9	-3.6	-4.2	-3.2	-3.8	-2.8	-3.4	-3.9	-2.9	-3.5	-2.5	TA
Timor-Leste						0	1	2	3	4	4.	3	3.	3.1	2.2	2.3	2.5	1.7	1.9	2.1	1.4	1.6	1.8
Western Asia																							
Lebanon	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Qatar	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
United Arab Emirates	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Bahrain	0	1	2	3	4	-5.1	-14.1	-13.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Turkey	0	-2.5	-1.5	-3.9	-6.3	-8.6	-10.9	-13.2	-12.2	-14.4	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Saudi Arabia	0	1	2	-3.4	-2.4	-1.4	-6.6	-5.6	-4.6	-9.9	-8.9	-7.9	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Oman	0	1	2	0.5	1.5	2.5	1.	-0.5	-1.9	-0.9	-2.3	-3.7	-2.7	-4.	-5.3	-6.6	-5.6	-6.9	TA	TA	TA	TA	TA
Iraq	0	1	2	3	4	5	3.6	4.6	5.6	4.2	5.2	6.2	4.9	5.9	4.5	5.5	4.2	5.2	6.2	5.	6.	4.7	5.7
Syrian Arab Republic	0	1	2	3	4	5	6	3.3	4.3	5.3	2.7	3.7	4.7	5.7	6.7	4.1	5.1	6.1	7.1	4.5	5.5	6.5	7.5
State of Palestine		0	-11.1	-10.1	-9.1	-8.1	-7.1	6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21
Kuwait																							
Jordan	0	1	2	3	4	5	6	7	8	9	10	11	12	13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22
Yemen	0	1	> 2	> 3	> 4	> 5	> 6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22
Oceania																							
Cook Islands	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
French Polynesia	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Guam	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
American Samoa	0	1	2	-5.4	-4.4	-11.8	-10.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Tuvalu	0	1	-3.1	-2.1	-6.2	-5.2	-4.2	-8.2	-7.2	-11.1	-10.1	-9.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Fiji	0	-2.5	-1.5	-3.9	-6.3	-5.3	-7.6	-6.6	-8.9	-11.2	-10.2	-12.4	-11.4	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Samoa	0	1	-2.7	-1.7	-5.3	-4.3	-7.8	-6.8	-5.8	-9.3	-8.3	-11.8	-10.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Tokelau	0	1	2	3	4	-0.1	0.9	-3.2	-2.2	-6.2	-5.2	-9.1	-8.1	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Vanuatu	0	-0.5	-2.4	-2.9	-4.6	-5	-5.4	-7.	-7.3	-8.8	-9.	-9.3	-10.7	-10.8	TA	TA	TA	TA	TA	TA	TA	TA	TA
Northern Mariana Is	0	1	2	3	-4.4	-3.4	-2.4	-1.4	-0.4	0.6	-6.8	-5.8	-4.8	-3.8	-2.8	-1.8	TA	TA	TA	TA	TA	TA	TA
Palau	0	1	-3.1	-2.1	-1.1	-0.1	-4.2	-3.2	-2.2	-1.2	-0.2	-4.2	-3.2	-7.1	-6.1	-5.1	TA	TA	TA	TA	TA	TA	
New Caledonia									0	1	2	3	4	-0.7	0.3	1.3	-3.4	-2.4	TA	TA	TA	TA	TA
Nauru							0	1	2	3	4	5	0.5	1.5	2.5	3.5	-0.9	0.1	1.1	2.1	-2.3	-1.3	-0.3
Marshall Islands	0	1	2	3	4	-1.4	-0.4	0.7	1.7	2.7	3.7	4.7	5.7	6.7	1.4	2.4	3.4	4.4	5.4	6.4	7.4	8.4	3.2
Kiribati	0	1	0.8	0.6	0.4	1.4	1.3	1.1	-0.1	-0.2	-0.2	-0.2	0.8	0.7	0.7	1.7	1.8	2.8	2.8	2.8	3.8	3.9	4.
Solomon Islands											0	1	2	3	4	5	6	7	8	9	10	11	10.4
Papua New Guinea		0	1	> 2	> 3	4	5	6	7	7.	8.	9.	9.	10.	11.	11.	12.	12.1	13.1	14.1	14.2	15.2	15.3
Niue																							
Tonga																							
Micronesia (Fed States)	0	1	2	3	4	5	6	> 7	> 8	> 9	> 10	> 11	> 12	> 13	> 14	> 15	> 16	> 17	> 18	> 19	> 20	> 21	> 22

SOURCE: Own calculations based on data from UN (2015a).

Internet users per 100 inhabitants for 151 countries

This ICT indicator IND 8.16 Internet users per 100 inhabitants is only indicator out of 10 selected indicators in Gaptimer Progress Chart for which all world regions were ahead of their lines to target in 2015 (25 per 100 in 2015). Even at the country levels for 151 countries there were only 39 countries with calculated time lag behind the line to target, of which 29 in Sub-Saharan Africa. Even more, the largest delay was in Eritrea with 6.2 years time gap, which is the smallest country deviation for all 10 selected indicators.

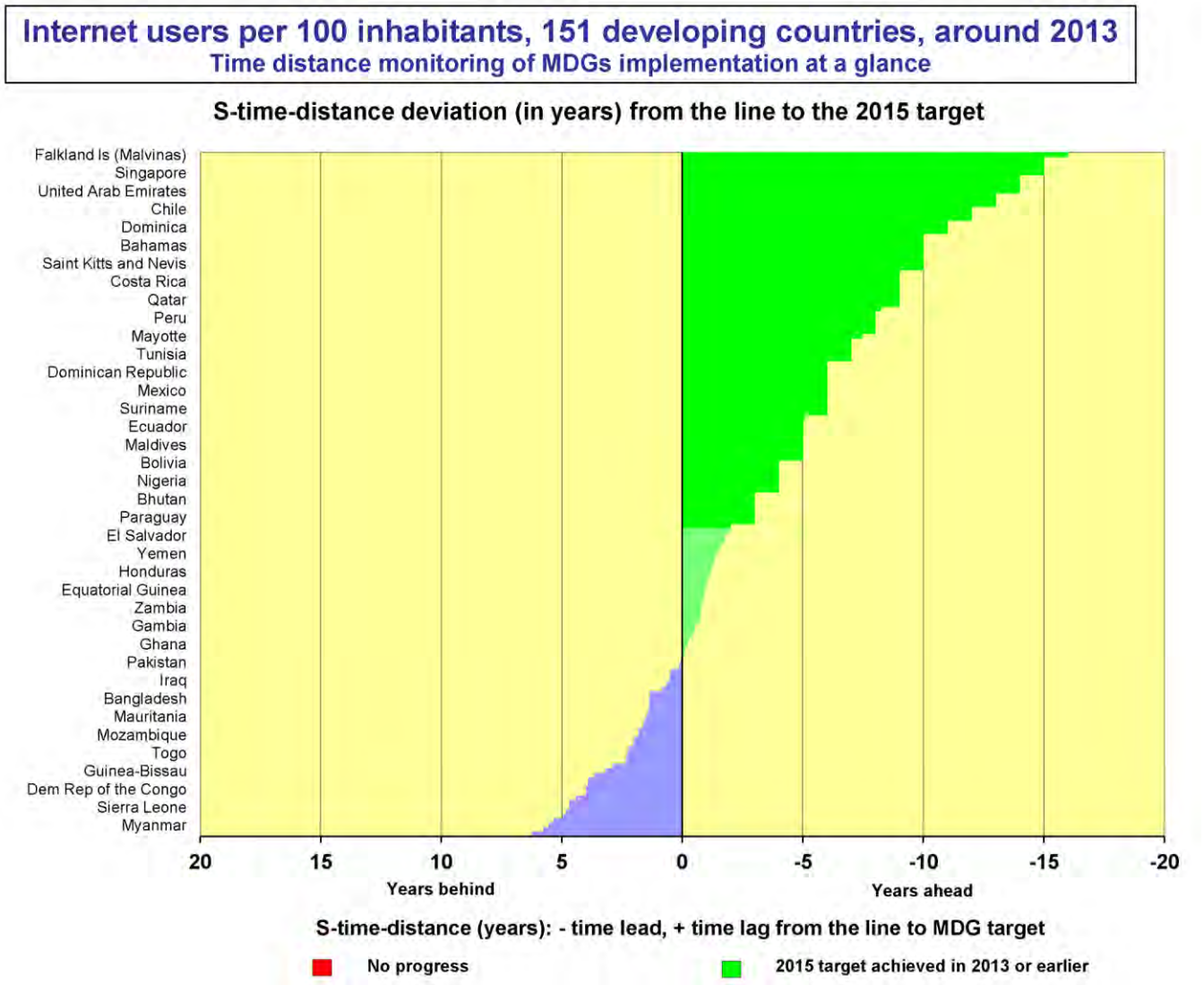


FIGURE 35 S-Time-Distance monitoring MDGs for indicator Internet users per 100 inhabitants in 2013 (or latest available year)

SOURCE: Own calculations based on data from UN (2015a).

TABLE 12 Results of S-time-distance monitoring of MDGs for Internet users per 100 inhabitants

S-time-distance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Northern Africa																								
Morocco							0.4	-0.4	-4.2	-3.8	-6.1	-6.8	-7.2	-7.	-9.1	-8.7	-8.4	-7.6	TA	TA	TA	TA	TA	TA
Tunisia					-1.6	-0.6	-2.4	-2.1	-3.6	-9.2	-9.5	-9.6	-9.1	-8.6	-8.3	-7.6	-7.3	-7.1	TA	TA	TA	TA	TA	TA
Egypt					-1.6	-3.4	-4.1	-4.1	-4.3	-5	-5.9	-5.6	-7.5	-7.5	-9.1	-8.3	-7.5	-6.9	-6.2	TA	TA	TA	TA	TA
Algeria								1.4	0.7	-4.1	-5.3	-5.	-6.2	-6	-6.8	-6.4	-6.	-5.6	-4.8	-4.	-3.3	-2.5	-1.7	-1.
Libya										-3.	-2.9	-3.6	-7.	-6.6	-6.1	-5.4	-4.6	-3.9	-4.4	-3.9	-3.5	-2.5		-1.
Sub-Saharan Africa																								
Seychelles							-10.	-10.6	-11.3	-12.5	-12.	-12.	-11.6	-10.6	-10.9	TA	TA	TA	TA		TA	TA	TA	TA
Mayotte											-7.5													
Cape Verde								-6.5	-7.2	-8.4	-8.5	-8.5	-8.1	-7.6	-7.2	-6.5	-5.8	-5.2	-5.5	-5.5	TA	TA	TA	TA
Mauritius							-6.8	-8.2	-11.3	-11.8	-11.9	-11.4	-10.8	-10.2	-9.5	-8.7	-8	-7.4	-6.6	-5.7	TA	TA	TA	TA
Kenya							0.4	-1.4	-1.6	-2.6	-4.2	-4.9	-5.5	-6.7	-5.8	-4.8	-6.	-5.1	-4.3	-3.7	-3.5	TA	TA	TA
Nigeria							0.4	-0.4	-0.4	-0.1	-0.1	-0.1	-2.2	-2.6	-3.6	-5.2	-5.2	-4.7	-5.9	-5.4	-4.9	TA	TA	TA
South Africa		-4.6	-7.1	-8.6	-9.6	-11.1	-10.6	-11.2	-11.7	-11.5	-11.2	-10.6	-9.7	-8.8	-8.3	-7.	-6.1	-5.2	-4.3	-3.7	-4.9	TA	TA	TA
Swaziland							-3.6	-4.1	-3.3	-6.2	-6.9	-6.6	-6.5	-6.2	-5.9	-5.2	-4.2	-3.5	-3.8	-3.4	-3.	-3.2	-2.5	-2.
Sao Tome & Principe									-6.1	-5.5	-10.8	-10.6	-10.	-9.7	-9.4	-8.5	-7.6	-6.6	-5.8	-5.	-4.3	-3.4	-2.6	-1.8
Senegal							0.4	-1.4	-2.8	-5.1	-4.8	-6	-5.1	-5.9	-6.7	-5.9	-5.3	-5.1	-4.9	-4.6	-3.9	-3.1	-2.3	-1.5
Angola								1.4	0.7	-1.4	-1.6	-1.2	-1.8	-1.6	-1.1	-2.3	-2.6	-2.9	-2.8	-2.4	-2.7	-2.7	-2.	-1.3
Zimbabwe						-0.6	-1.4	-1.4	-2.8	-3.5	-4.8	-5.5	-8.4	-8.6	-7.7	-7.2	-6.6	-5.9	-5.1	-4.	-3.1	-2.8	-2.1	-1.2
Equatorial Guinea								-2.1	-3.1	-2.3	-2.	-1.6	-2.2	-2.4	-2.6	-2.4	-1.6	-1.1	-0.5	0.1	-1.4	-2.1	-1.5	-1.
Uganda								1.4	-2.4	-2.6	-2.5	-2.5	-2.6	-2.1	-2.2	-3.4	-3.3	-3.2	-4.1	-3.6	-3.3	-2.3	-1.6	-0.9
Zambia					-1.6	-0.6	0.4	1.4	-0.4	-3.3	-2.9	-2.4	-3.2	-4	-4.7	-4.6	-4.5	-4.	-3.2	-2.6	-2.7	-2.1	-1.4	-0.8
Botswana						-5.1	-6.5	-7.1	-7.8	-8.3	-9.6	-9.1	-8.1	-7.	-6	-5.	-4.6	-4.1	-3.5	-2.5	-1.4	-1.2	-1.1	-0.7
Gambia						-0.6	-3.1	-2.6	-5.2	-7.2	-6.8	-6.7	-6.5	-6.2	-6.	-5.3	-5.1	-4.5	-3.8	-3.1	-2.5	-1.9	-1.2	-0.5
Namibia						-0.6	0.4	-3.1	-6	-5.3	-8.2	-8.2	-7.4	-7.	-6.3	-5.4	-4.7	-3.9	-3.2	-2.6	-3.1	-2.2	-1.3	-0.5
Ghana							0.4	-1.4	-0.4	-2.3	-2.3	-2.1	-4.5	-4.4	-4.3	-3.5	-3.5	-3.3	-2.6	-2.2	-2.1	-2.5	-1.2	-0.2
Djibouti						-2.4	-2.4	-3.8	-3.1	-2.6	-2.9	-3.3	-3.3	-2.9	-2.4	-1.9	-1.6	-1.2	-1.1	-1.4	-1.6	-0.8	-0.2	0.4
Gabon								-2.6	-4.6	-4.6	-7.5	-6.8	-6.7	-6.4	-5.7	-6.	-5.2	-4.3	-3.5	-2.7	-1.9	-1.2	-0.3	0.5
Rwanda									2.4	-1.4	-0.1	-2.5	-2	-1.5	-1.	-0.6		-1.9	-2.7	-3.1	-2.2	-0.8	-0.2	0.7
Congo										1.7	1.7	2.7	-0.5	-2.1	-3.2	-3.	-2.7	-2.5	-2.6	-1.7	-1.	-0.3	0.5	1.3
Comoros									-1.1	-3.3	-3.8	-4.	-3.5	-3.6	-3.7	-3.7	-3	-2.3	-1.7	-1.1	-1.1	-0.2	0.6	1.4
Cameroon								1.4	2.4	-3.	-3.6	-2.9	-2.5	-2.7	-3	-2.9	-2.8	-2.7	-2.1	-1.3	-0.6	0.	0.7	1.4
Mauritania									-1.1	-2.8	-2.9	-2.7	-2.5	-1.9	-1.2	-1.1	-1	-0.9	-0.6	-0.1	-0.4	0.3	0.8	1.5
Malawi									0.7	-2.1	-2.	-1.5	-1.3	-0.9	-0.4	0.4	1.	0.	1.9	1.8	1.	1.	1.4	1.8
Mozambique								1.4	0.7	-1.1	-1.6	-1.5	-1.7	-1.9	-2.1	-1.6	-0.6	0.2	-0.1	-0.4	-0.5	0.4	1.1	1.8
Lesotho								1.4	2.4	-0.6	-3.2	-2.7	-5.2	-5.1	-5.	-4.4	-3.7	-3.1	-2.2	-1.3	-0.3	0.4	1.2	2.
Benin								-0.4	-1.6	-3.3	-3.4	-3.5	-4.2	-3.9	-3.4	-2.6	-2.1	-1.4	-0.5	0.	0.2	0.5	1.3	2.
Liberia										3.4	2.7	2.7	3.7	4.7	5.7			1.5	2.6	3.7	0.9	1.3	1.7	2.2
Togo							0.4	-6.2	-6.1	-6.7	-6.5	-5.8	-5.	-4.5	-4.	-3.5	-2.7	-2	-1.2	-0.4	0.3	0.9	1.6	2.3
Burkina Faso								-0.4	-1.6	-1.1	-0.8	-1.5	-1.1	-1.6	-0.8	-0.2	0.1	0.7	1.2	1.7	0.8	1.3	1.7	2.3
U. Rep of Tanzania								1.4	2.4	-1.8	-1.8	-1.6	-1.3	-3.1	-2.7	-2.3	-1.7	-1.2	-0.6	-0.2	0.4	0.9	1.6	2.3
Central African Rep							0.4	1.4	-0.4	-0.1	0.4	0.2	0.	0.7	0.7	1.2	1.9	2.4	1.	0.6	1.3	2	2.3	2.9
Guinea-Bissau								-0.4	0.7	-2.8	-3.4	-3.1	-5.1	-4.8	-4.5	-3.6	-2.8	-2.	-1.1	-0.1	0.8	1.6	2.4	3.2
Cote d'Ivoire							0.4	-0.4	-2.1	-2.8	-3.4	-3.8	-3.3	-3.3	-2.6	-2.1	-2.1	-1.5	-0.6	0.3	1.1	2	2.8	3.6
Chad										3.4	0.9	1.4	-0.6	-1.2	-0.5	0.2	0.3	0.4	0.6	1.	1.7	2.4	3.1	3.9
Mali								1.4	0.7	-1.1	-2.2	-1.9	-1.4	-1.1	-1.	-0.3	-0.2	0.5	-0.1	0.6	1.4	2.3	3.	3.9
Dem Rep of the Congo											4.4	5.4	0.9	1.	0.9	1.5	1.9	2.5	3.	3.4	3.8	3.6	3.7	4
Madagascar								1.4	-2.1	-3.6	-3.1	-2.3	-2.3	-1.9	-1.4	-0.6	0.2	1.	-0.3	0.8	1.7	2.4	3.2	4
Ethiopia									2.4	3.4	2.7	1.9	1.6	1.4	1.5	1.7	1.9	2.5	2.9	3.5	3.7	3.8	4.	4.4
Niger										0.7	0.9	-0.6	0.	0.5	1.1	1.7	2	2.3	1.9	2.7	3.5	3.3	4.1	4.7
Sierra Leone									2.4	-0.6	-1.8	-1.5	-0.8	0.1	0.9	1.7	2.6	3.5	4.4	5.3	4.3	4.2	4.3	4.7
Guinea									2.4	-1.1	-1.3	-1.8	-2.8	-2.1	-1.3	-0.5	0.1	0.6	1.2	2.1	3.	3.3	4.	4.8
Somalia									2.4	3.4	2.7	0.2	0.2	-1.6	-3.2	-2.2	-1.3	-0.3	0.7	1.6		3.4	4.2	5.
Burundi								1.4	0.7	-0.1	-0.8	-0.6	0.2	-0.1	-0.4	-0.5	0.	0.9	1.5	2.2	3.	3.7	4.5	5.3
Eritrea								1.4	2.4	0.7	-2.2	-1.5	-1.4					2.2	2.8	3.5	4.2	4.9	5.6	6.2

TABLE 12 (continued) Results of S-time-distance monitoring of MDGs for Internet users per 100 inhabitants

S-time-distance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Latin America and the Caribbean																								
Falkland Is (Malvinas)								-13.3		TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Anguilla						-11.5					-14.7	TA	-13.	-11.9	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Barbados						-0.6	-8.7	-9.4	-10.7	-10.2	-10.4	-12.2	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
US Virgin Islands					-12.9	-14.6	-14.8	-14.8	-14.5	-14.	-13.5	-13.2	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Chile			-7.1	-7.4	-8.2	-9.4	-10.1	-10.2	-10.3	-11.5	-14.	-13.3	-12.7	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Trinidad & Tobago						-7.5	-8.7	-10.4	-11.5	-12.4	-12.1	-12.8	-12.6	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Dominica						-10.5	-11.4		-11.7	-10.7	-12.4	-12.4	-12.2	-11.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Antigua and Barbuda						-14	-13.6	-13.1	-12.5	-12.1	-11.6	-11.4	-11.3	-11.1	-10.9	TA	TA	TA	TA	TA	TA	TA	TA	TA
Aruba							-13.5			-11.7	-13.8	-13.1	-12.3	-11.5	-10.8	TA	TA	TA	TA	TA	TA	TA	TA	TA
Bahamas						-11.9	-12.4	-10.8	-11.1	-11.3	-12.2	-12.1	-12.2	-11.4	-10.6	TA	TA	TA	TA	TA	TA	TA	TA	TA
Cayman Islands						-15.4										TA	TA	TA	TA	TA	TA	TA	TA	TA
Saint Kitts and Nevis							-12.7	-12.1	-12.	-11.7	-11.4	-11.1	-12.5	-11.8	-11.	TA	TA	TA	TA	TA	TA	TA	TA	TA
Brazil			-3.6	-5.4	-5.1	-6.6	-9.1	-9.4	-10.	-9.8	-9.6	-9.8	-10.5	-10.4	-10.3	-9.5	TA	TA	TA	TA	TA	TA	TA	TA
Costa Rica				-7.8	-9.9	-9.9	-10.6	-11.2	-11.4	-11.4	-11.4	-11.6	-12.4	-11.4	-10.5	-9.7	TA	TA	TA	TA	TA	TA	TA	TA
Montserrat																	TA	-7.5	-6.4	-5.4	TA	TA		TA
Puerto Rico					-4.4	-7.2	-7.8	-10.7	-11.4	-12.1	-12.8	-12.8	-12.1	-11.4	-10.7	-9.8	TA	TA	TA	TA	TA	TA	TA	TA
Uruguay					-6.1	-9.1	-12.5	-13.	-13.8	-13.7	-12.8	-12	-11.1	-10.9	-10.1	-9.4	TA	TA	TA	TA	TA	TA	TA	TA
Netherlands Antilles							-7.7			-8.3														
Argentina				-5.4	-5.1	-6.1	-6.2	-6.9	-8.5	-11.	-11.9	-11.6	-10.9	-10.1	-9.9	-9.1	-8.5	TA	TA	TA	TA	TA	TA	TA
Peru					-1.6	-3.4	-7.6	-7.8	-9.4	-9.7	-9.8	-11.	-10.4	-10.1	-9.5	-9.1	-8.5	TA	TA	TA	TA	TA	TA	TA
Saint Lucia						-9.1	-10.1	-10.	-9.7	-9.6	-11.1	-11.2	-11.6	-11.5	-10.6	-9.6	-8.9	TA	TA	TA	TA	TA	TA	TA
Colombia					-7.6	-7.9	-8.3	-8.5	-9.3	-9.3	-9.	-8.6	-8.8	-9.	-8.5	-8.	-7.8	-7.6	TA	TA	TA	TA	TA	TA
Panama					-1.6	-5.1	-7.3	-8.5	-11.5	-11.3	-11.7	-10.9	-10.3	-9.7	-9	-8.1	-8.1	-7.7	TA	TA	TA	TA	TA	TA
Venezuela R.B.			-3.6	-6.1	-6.1	-6.8	-7.6	-7.7	-9.8	-10.6	-10.	-9.8	-9.	-9.	-8.3	-8.3	-7.7	-7.5	TA	TA	TA	TA	TA	TA
British Virgin Islands													-12.3							TA	TA			TA
Dominican Republic						-2.4	-4.4	-5.2	-5.4	-8.3	-10.2	-9.7	-9.8	-9.1	-8.4	-8.1	-7.7	-7.1	-6.5	TA	TA	TA	TA	TA
Mexico		-4.6	-5.4	-5.4	-5.1	-6.3	-7.1	-8.9	-9.6	-9.5	-11.1	-10.9	-11.1	-10.3	-9.5	-9.1	-8.3	-7.5	-6.6	TA	TA	TA	TA	TA
St Vincent & Grenadines						-7.	-9.2	-9.9	-10.5	-10.5	-10.	-10.1	-9.2	-8.6	-8.	-7.5	-7.2	-6.9	-6.5	TA	TA	TA	TA	TA
Suriname						-6.6	-7.4	-10.	-10.3	-9.6	-9.3	-8.8	-8.5	-7.9	-7.5	-6.6	-6.6	-6.5	-6.5	TA	TA	TA	TA	TA
Ecuador			-3.6	-4.4	-4.4	-4.1	-5.1	-4.6	-4.	-7.5	-8.	-8.4	-8.6	-7.7	-6.9	-6.4	-5.9	-5.9	-6.3	-6.	TA	TA	TA	TA
Grenada							-8.1	-10.	-10.	-10.3	-10.5	-10.1	-11.7	-11.2	-10.4	-9.5	-8.6	-7.7	-6.8	-5.9	TA	TA	TA	TA
Guyana							-4.4	-5.	-5.7	-11.4	-11.7	-12.4						-6.5	-6.2	-5.9	TA	TA	TA	TA
Jamaica					-5.1	-6.6	-9.7	-9.5	-10.7	-10.2	-9.8	-9.3	-9.5	-9.1	-8.7	-8.3	-8.	-7.5	-6.8	-5.9	TA	TA	TA	TA
Bolivia						-5.4	-7.1	-8.1	-7.9	-8	-7.9	-7.9	-7.8	-7.1	-6.7	-6.1	-5.5	-5.8	-5.3	-5.	-4.7	TA	TA	TA
Belize						-4.6	-10.7	-10.6	-10.9	-11.5	-11.4		-9.3		-7.3	-7.5	-6.8	-5.9	-5.	-4.1	-3.5	-3.2	TA	TA
Cuba							-2.4	-3.4	-5.4	-5.1	-5.5	-6.2	-8.3	-8.1	-8.3	-7.6	-7.	-6.1	-5.3	-4.6	-3.9	-2.9	TA	TA
Paraguay							-1.4	-4.3	-4.9	-5.6	-6.3	-6.3	-6.4	-5.9	-6.1	-7.1	-6.2	-6.	-5.6	-5.3	-4.4	-4.	TA	TA
El Salvador							-5.1	-6.7	-7.	-7.6	-7.4	-7.	-6.6	-6.3	-5.9	-5.6	-5.2	-4.5	-4.7	-4.2	-3.9	-3.3	-2.4	-1.8
Guatemala							-1.4	-4.3	-7.2	-6.7	-6.2	-7.4	-8.1	-7.8	-7.1	-6.3	-5.6	-5.	-4.2	-3.5	-2.8	-2.2	-1.9	-1.4
Honduras						-4.1	-3.1	-5.6	-6.1	-6.6	-7.5	-6.9	-7.4	-7.9	-7.3	-6.6	-6.1	-5.5	-4.6	-3.6	-3.	-2.9	-2.2	-1.1
Nicaragua					-1.6	-3.4	-4.8	-6.2	-6.1	-6.3	-7	-7.	-6.3	-5.6	-5.1	-4.3	-3.6	-3.4	-3.1	-3.	-2.7	-1.9	-1.4	-0.8
Haiti							0.4		0.7	-1.4	-3.4	-3.3	-4.7	-5.3	-7.2	-6.6	-5.8	-4.9	-4.1	-3.2	-2.3	-1.4	-0.6	0.1
Eastern Asia																								
Hong Kong SAR of China		-10.8	-14.6	-14.7	-15.5	-14.9	-14.9	-15.8	-15.6	-15.6	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Korea, Rep	0	-2.2	-3.6	-5.8	-5.6	-8.	-9.4	-11.2	-12.4	-15.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Macao SAR of China					-5.1	-8.9	-10.2	-12.2	-13.8	-13.5	-13.5	-13.7	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
China							0.4	-1.4	-4.6	-7.2	-8.4	-8.4	-8.8	-8.5	-8.	-7.3	-6.8	-6.9	-6.7	TA	TA	TA	TA	TA
Mongolia						-0.6	-1.4	-4.6	-4.3	-6.3	-7.6	-7.3	-6.8					-5.4	-4.6	-3.7	-2.8	-2.3	-2.	-1.1

TABLE 12 (continued) Results of S-time-distance monitoring of MDGs for Internet users per 100 inhabitants

S-time-distance	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Southern Asia																								
Maldives							-7.4	-7.1	-7.6	-8.3	-9	-9.2	-9.2	-8.4	-7.7	-6.8	-7.	-6.9	-6.8	-6.	TA	TA	TA	TA
Bhutan										-3.2	-4.8	-5.6	-6.3	-6.2	-5.9	-5.3	-4.7	-4.4	-3.7	-2.9	-3.5	-3.5	TA	TA
Iran (Islamic Rep)							-1.4	-2.6	-3.3	-5.6	-6.9	-7.	-8.8	-8.8	-8.	-7.2	-6.4	-5.6	-4.8	-4.	-3.6	-3.5	TA	TA
Sri Lanka						-0.6	-3.6	-5.5	-6.1	-5.4	-6.	-5.4	-5.2	-5.	-4.	-3.4	-3.3	-3.4	-3.4	-3.4	-3.2	-2.7	-2.2	-1.6
India						-3.4	-3.6	-3.4	-4.2	-4.8	-5.4	-5.	-6.1	-5.3	-4.7	-4.2	-3.6	-3.4	-2.7	-2.1	-2.	-1.7	-1.3	-0.7
Nepal								-0.4	-2.1	-3.3	-3.1	-2.5	-2.1	-1.6	-1.1	-1.5	-1.3	-0.9	-0.4	0.3	-2.1	-1.4	-1.	-0.4
Pakistan								-1.4	-1.1	-1.1		-6.7	-7.4	-8.	-7.5	-6.6	-5.6	-4.8	-3.8	-3.	-2.2	-1.4	-0.7	0.1
Bangladesh										-0.1	-0.4	-1.	-0.2	0.5	0.9	1.5	-1.	-1.5	-1.3	-0.8	-0.2	0.	0.7	1.4
Afghanistan														1.9	2.4	-2.5	-2.9	-1.6	-0.5	-1.2	-0.4	0.	0.8	1.6
South-Eastern Asia																								
Singapore		-11.5	-13.2	-13.3	-13.4	-14.6	-16.3	-16.4	-16.4	-15.9	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Malaysia				-5.4	-7.3	-7.3	-10.6	-12.1	-13.7	-14.2	-14.6	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Brunei Darussalam						-12.1	-14	-13.9	-13.5	-13.1	-12.4	-12.3	-11.8	-11.4	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Viet Nam									2.4	-3.	-3.6	-6.6	-6.5	-7.3	-8.1	-8.3	-8.1	-7.5	-6.9	TA	TA	TA	TA	TA
Philippines					-1.6	-3.4	-4.1	-5.2	-9.3	-8.9	-8.7	-8.3	-8.6	-8.	-7.1	-6.2	-5.3	-4.4	-3.5	-3.4	TA	TA	TA	TA
Thailand				-2.6	-5.1	-5.4	-5.8	-7.5	-9.2	-10.2	-10.2	-10.3	-10.	-9.5	-8.9	-8.7	-8.1	-7.4	-6.2	-5.4	-4.7	-3.8	TA	TA
Indonesia						-3.4	-4.1	-5.9	-5.7	-6.	-6.9	-7.8	-6.9	-6.2	-5.4	-5.2	-4.9	-4.3	-4.1	-2.8	-3.	-2	-1.6	-0.9
Lao People's Dem Rep									2.4	-0.1	-1.6	-1.8	-1.8	-1.3	-0.5	-1.6	-1.4	-1.2	-2.2	-2.4	-1.8	-1.4	-0.9	-0.3
Cambodia								1.4	0.7	0.7	0.4	0.2	-1.4	-0.7	-0.1	0.8	0.8	1.8	2.7	3.6	2.4	1.2	1	1.6
Myanmar														5.7	6.7	4.6	3.2	3.7	4.7	5.7	6.4	4	4.8	5.6
Timor-Leste																3.7	4.2	4.8	5.5	6.1	6.8	4.2	5.2	5.8
Western Asia																								
United Arab Emirates						-6.3	-8.6	-13	-13.8	-14.7	-14.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Kuwait				-8.1	-8.3	-8.1	-10.6	-12.	-11.8	-11.9	-11.7	-11.3	-10.8	-11.7	-10.8	TA	TA	TA	TA	TA	TA	TA	TA	TA
Bahrain						-9.4	-10.6	-11.3	-11.9	-11.9	-11.5	-12.7	-12.2	-11.6	-10.6	-9.6	TA	TA	TA	TA	TA	TA	TA	TA
Qatar						-7.9	-10.9	-12.8	-12.1	-11.5	-11.	-10.5	-10.8	-11.3	-10.5	-10.	TA	TA	TA	TA	TA	TA	TA	TA
Saudi Arabia						-0.6	-2.4	-2.6	-3.3	-6.3	-9.	-9.8	-9.6	-9.2	-8.8	-8.3	-8.3	TA	TA	TA	TA	TA	TA	TA
Turkey				-2.6	-5.6	-5.8	-6.9	-8.2	-8.2	-10.1	-10.3	-10.1	-11.1	-10.2	-9.6	-8.8	-8.2	TA	TA	TA	TA	TA	TA	TA
Jordan						-2.4	-3.1	-8.8	-9.7	-10.3	-9.4	-9.9	-9.4	-9.3	-9.1	-8.3	-7.5	-7.4	-6.8	TA	TA	TA	TA	TA
Lebanon						-5.4	-6.2	-10.5	-11.5	-12.2	-12.1	-10.7	-9.8	-9.2	-8.4	-7.7	-7.7	-7.3	-6.7	TA	TA	TA	TA	TA
Oman								-8.	-8.6	-10.3	-10.1	-10.4	-9.8	-8.9	-7.7	-6.7	-6.2	-7	-6.4	TA	TA	TA	TA	TA
State of Palestine											-7.3	-7.5	-7.8	-7.5	-6.7	-8.9	-8.2	-7.5	-6.9	TA	TA	TA	TA	TA
Syrian Arab Republic								-1.4	-2.1	-2.8	-2.8	-3.4	-6.9	-7.1	-6.6	-6.3	-6.1	-6.1	-5.5	-5.1	-4.5	-3.7	-2.9	TA
Yemen								-0.4	0.7	-1.1	-0.8	-0.1	-3.4	-2.8	-2.7	-2.2	-1.6	-4.	-3.8	-3.7	-3.2	-2.7	-2.1	-1.4
Iraq												-0.3	-3.3	-2.8	-2.8	-1.8	-0.9	0.2	1.	1.8	0.7	0.	0.1	0.5
Oceania																								
Niue										-14.8	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Guam					-10.4	-11.	-11.8	-12.1	-12.7	-13.3	-13.9	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
New Caledonia						-0.6	-7.6	-10.	-10.7	-12.3	-13.5	-13.2	-12.7	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA
Palau													-12.4	-11.6	TA									
Cook Islands						-12.4	-15.2	-14.7		-14.4	-13.8	-13.2	-12.4	-11.7	-10.9	TA	TA	TA	TA	TA	TA	TA	TA	TA
French Polynesia							-5.1	-6.2	-9.7	-11.1	-11.6	-10.5	-10.2	-10.5	-10.1	-9.6	TA	TA	TA	TA	TA	TA	TA	TA
Tokelau														-5.										
Tuvalu											-11.1							-5.7	-5.7	-5.4	TA	TA	TA	TA
Fiji				-2.6	-1.6	-0.6	-4.1	-6.3	-7.9	-7.9	-8.	-7.5	-9.5	-8.7	-8	-7.3	-6.6	-5.9	-5.3	-5.	-4.4	TA	TA	TA
Nauru												-8.7										TA		
Tonga						-6.8	-6.5	-8.3	-8.4	-8.1	-9.2	-8.6	-7.7	-6.7	-6.4	-6.	-5.4	-4.9	-4.2	-3.7	-3.9	TA	TA	TA
Micronesia (Fed States)							-7.9	-8.6	-10.5	-10.6	-10.3	-9.8	-9.3	-9.5	-9.	-8.1	-7.3	-6.5	-5.6	-4.8	-4.4	-3.7	TA	TA
Samoa								-5.6	-5.4	-5	-5.6	-7.3	-7.	-6.6	-5.8	-5.	-4.7	-3.9	-3.	-2.4	-1.8	-2.	-1.3	-0.8
Marshall Islands							-3.1			-8.	-8.1	-7.3	-7.1	-6.3	-6.2	-5.4	-4.3	-3.4	-2.8	-2.3	-1.8	-1.2	-0.7	-0.1
Kiribati									-7.9	-8.5	-8.4	-8.1	-7.3	-6.7	-6.1	-5.4	-4.7	-4.4	-3.8	-3.4	-2.5	-1.7	-0.9	-0.1
Vanuatu							-4.1	-5.2	-5.8	-6.5	-8.9	-8.6	-8.1	-7.4	-6.9	-6.1	-5.4	-4.8	-3.9	-3.	-2.2	-1.5	-0.9	0.
Solomon Islands						-2.4	-7.8	-7.7	-7.3	-6.3	-5.2	-4.2	-3.3	-2.6	-2.	-1.6	-2.3	-1.7	-1.7	-1.4	-1.	-0.4	0.2	0.8
Papua New Guinea								-4.3	-5.4	-7.1	-6.6	-5.8	-5.7	-4.8	-4.1	-3.3	-2.4	-1.4	0.7	0.8	2.4	2.3	1.9	1.4

SOURCE: Own calculations based on data from UN (2015a).

Proportion of population using an improved sanitation facility, total for 154 countries

For this indicator the MDG target was to halve the share of population without access to improved sanitation. In the main text we only show the overall situation in Figure 36. The best countries were Republic of Korea, Kuwait, Qatar, and New Caledonia, which already in 1990 showed 100 percent access to good sanitation facilities. The three largest delays for this indicator in the Gaptimer Progress Chart are for Sub-Saharan Africa, India and Southern Asia. In Sub-Saharan Africa only three countries were around 2012 ahead of the line to 2015 targets (Rwanda, Cape Verde, and Angola).

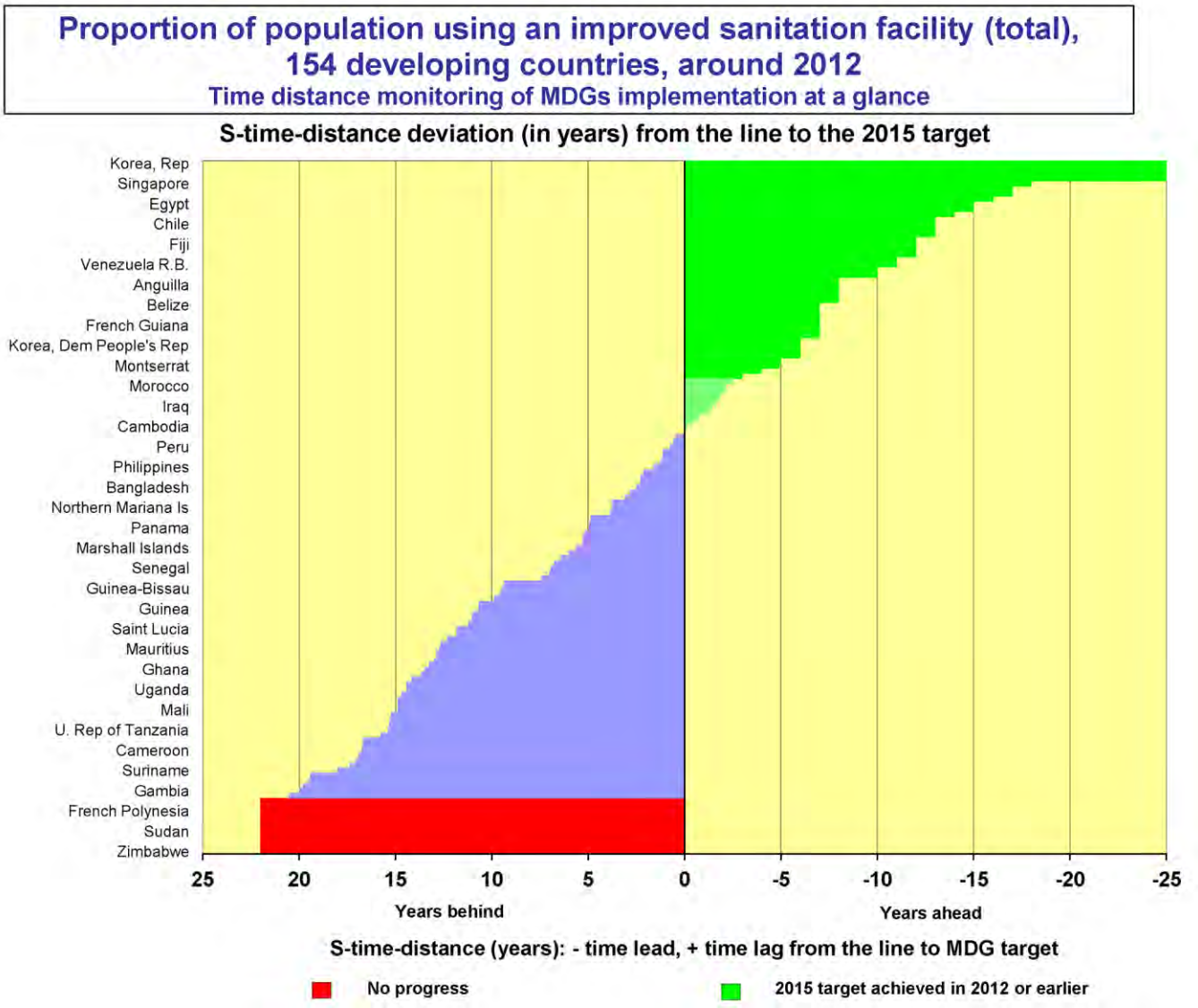


FIGURE 36 S-Time-Distance monitoring MDGs for indicator Proportion of population using an improved sanitation facility, total in 2012 (or latest available year)
SOURCE: Own calculations based on data from UN (2015a).

Maternal mortality ratio for 125 countries

For this indicator the target to reduce the ratio by ¾ was obviously too difficult. By 2013 only 15 countries were ahead of the line to 2015 target. Data for the indicator are available only for a few years in the analysed period and therefore we do not present the table by countries, though the calculations are presented in Figure 37 to give the overall impression of the situation. This is the indicator for which no world region was either ahead of the line to 2015 target or achieving the target during the period. The maternal mortality ratio is clearly the area of great concern for the post-2015 activity.

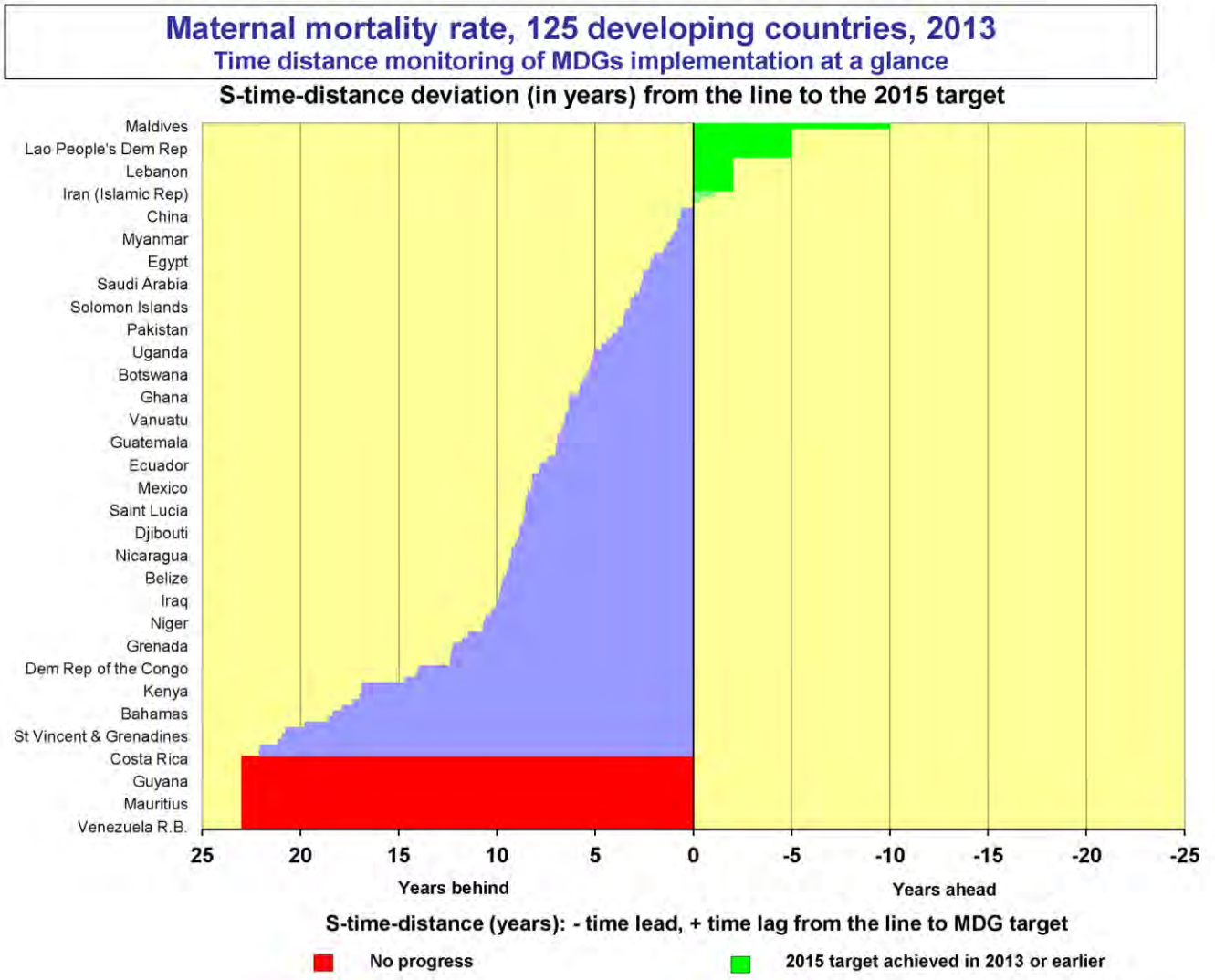


FIGURE 37 S-Time-Distance monitoring MDGs for indicator maternal mortality rate in 2013
SOURCE: Own calculations based on data from UN (2015a).

Chapter 6

INNOVATIVE ADDITIONAL S-TIME-DISTANCE METHOD FOR MONITORING IMPLEMENTATION OF POST-2015 SUSTAINABLE DEVELOPMENT GOALS

The telling power of the time distance is very relevant to see the reality better from more perspectives. There is a strong case that in the post-2015 agenda we will need in addition to some overall targets also targets at the national levels and with the broadening of concern to national level the importance of the time distance method will grow significantly. Easily understandable time distance measure helps to interpret information at many macro and micro levels for decision making, strengthening the capacity of decision-makers to understand what is really happening and to encourage broader participation.

There are a number of materials like UN (2013a), Sustainable Development Solutions Network (2013), and OECD (2013) towards post-2015 agenda that have shaped the discussion about the sustainable development endeavour. SDSN Report (2015) 'Indicators and a Monitoring Framework for the Sustainable Development Goals: Launching a data revolution for the SDGs' outlined a proposal for 100 Global Monitoring Indicators together with suggestions for Complementary National Indicators.

Report suggests that indicators will be the backbone of monitoring progress towards the SDGs at the local, national, regional, and global levels, as well as together with the targets representing a management tool to help countries develop implementation strategies and allocate resources accordingly. It could serve as a report card to measure progress towards sustainable development and help ensure the accountability of all stakeholders for achieving the SDGs.

It is stated that an emerging consensus suggests that the focus of SDG monitoring will be at the national level, with complementary monitoring at regional and global levels. Also thematic monitoring and review will be an important complement to official monitoring and review at national, regional, and global levels. It is emphasised that to align with national planning and budgetary processes, SDG monitoring needs to operate on an annual cycle to be management and policy tool.

There is detailed description of the suggested indicators and institutions involved. It is stated that the revolution in information and communication technologies and the growing role of civil society organizations and businesses offer unprecedented opportunities for using new types of complementary metrics and data. However, it does not expand this statement enough beyond the difficult task to provide new data for indicators to other steps needed to make the SDGs an effective management and policy tool, including making results of the statistical measures more understandable to general public.

Namely, in a broader context measuring well-being and societal progress entities is a complex undertaking and involves in its essence the search of how to answer in an agreeable way two questions, which transcend fields of concern and technicalities: PERCEPTION ABOUT WHAT (elements of well-being and societal progress) and WHICH MEASURES TO USE TO BUILD PERCEPTION ABOUT THEM

(measures to present and to communicate the topics also for policy making), Sicherl, 2006.

The availability of data and faster computer processing are expanding at an unprecedented pace. The benefit for better decision making will depend critically on **human interface**: understanding of the information and the communication of that understanding (Sicherl, 2004b). It is very important how people understand data and indicators. We need new data and indicators but we also need innovative concepts of looking at data and new generic statistical measures to better perceive and exploit the information available in existing data.

In the choices to be made in undertaking projects to measure progress it seems that the relative importance of the development of appropriate measures to build perceptions of the situation has been underrated (as compared to discussions of the choice of basic orientation, choice of dimension and of indicators). The perception of well-being and societal progress is subjective. An individual assigns different weights to various elements of well-being and progress and also gives different weights to the possible measures by which such elements are measured and presented. The concept of well-being and progress has to deal not only with the categories, measurement, and data availability but also with interpersonal and intertemporal comparisons of the chosen constituent elements (Sicherl, 2006).

In policy oriented research three types of issues are involved (Sicherl, 1992):

1) estimation of statistical measures of "position" and "progress", which can be thought of as 'objective' measures of the multidimensional notion of distances in time and indicator space for a set of indicators,
2) value judgements that are associated with them and that give subjective weights to the 'objective' measures within and across various dimensions and fields of concern,
3) analysis of behaviour related to reactions of people to the perceptions formed on such basis with respect to the level and change in their position.

Existing concepts, definitions and measures of well-being and progress are conventions with many alternatives and there are no final answers for dealing with interpersonal and inter-temporal issues. As the perceptions of well-being and progress are subjective it is thus even more important that we provide to decision makers as well as to general public the information and knowledge in various degrees of complexity with as clear as possible understanding and interpretability so that they can effectively use them as inputs in building their perception and decisions.

We deal here only with statistical measures at the first level of complexity. Besides the levels of the variable (indicator) the two most widely used measures are growth rate and static difference between two or more units. At the same level of generality there exists a companion generic statistical measure S-time-distance as a special category of time distances defined by the level of the variable. It yields a radical new view of time series datasets that has been left unexplored by the existing methods of time series analysis. The present state-of-the-art neglects this additional information available in existing time series databases and thus leads to an information loss that has no justification. In the information age this new view of the existing databases should be evaluated as an important contribution to a more efficient utilisation of the available information (Sicherl, 2006).

Here we can briefly indicate two most obvious ways of applying the time distance methodology to the post-2015 SDGs for analysis of indicators, discussing the setting of targets at various levels and follow the implementation of targets through the additional narrative of time lead or time lag against the proposed line to target.

For starting analysis of indicators over many units and over time and the consequent discussion for the setting of targets at various levels, the S-time-matrix format and visualisation described in Chapter 3 is relevant, elaborating on conventional table formats and possible additional time dimension complementary formats. The theoretical background for two trends over time the S-time matrix format can be illustrated as:

For two units (i) and (j) we can express such time series database as implicit functions

$$F_i\ (X, t) = 0 \text{ and } F_j\ (X\ , t) = 0 \qquad (3)$$

The present state-of-the-art solves these functions by one of the arguments as

$$X = X_i\ (t) \text{ and } X = X_j\ (t) \qquad (4)$$

and arrives at static distance like $\Delta X_{ij}(t) = X_i(t) - X_j(t)$. However, it misses the point that additional theoretically universal and practically relevant measures can be obtained by solving them by the other argument using the inverse relations

$$t = t_i\ (X) \text{ and } t = t_j\ (X) \qquad (5)$$

The result is a time matrix with new information and visualisation over units and over levels of indicator. The time matrix can be used also as one of the more procedures from which new generic statistical measures for comparison of time series data between two or more units S-time-distance and S-time-step can be derived. Sicherl (2012, p. 30). The definitions of the two measures are provided in Chapter 2, Section 1.

Chapter 3 provides calculations of time matrices for world regions for 10 selected MDG indicators, and for two indicators S-time-matrices were prepared by countries in a given world region (Under-five mortality rate for countries in Sub-Saharan Africa and for Internet users per 100 inhabitants for Latin America and Caribbean countries). The latter examples show how time matrices could be used by regional organisations to show the situation across the region or by countries themselves when they would select only those countries of their interest, either from their region or from other regions with interesting policies. In this chapter also an overview of disparities of 194 to 201 countries in two dimensions from benchmark Sweden for four selected indicators is provided to illustrate the time distance magnitude of inequalities in the world as a starting point.

Computer software Time Matrix Calculator was developed by Faculty of Social Sciences, University of Ljubljana and SICENTER, Ljubljana, Slovenia to enable users to calculate time matrix from their own data and specification and is available on www.timedistance.net.

Chapters 4 and 5 the main empirical part of the study of monitoring implementation of MDGs in time distance perspective for world regions and also S-time-distance results of MDG implementation for up to

154 developing countries for five selected indicators are presented. In a single table at a glance the results are presented for 100 cases across 10 MDG indicators and 10 units (7 world regions, Developing Regions, China, and India), expressed in time lead or time lag providing stories of the situation from the novel time perspective. To get the results in this Gaptimer MDG Progress Chart it was necessary to calculate the results for each unit of the 100 cases (10 unit times 10 indicators). In the same way any country can follow their implementation for the number of indicators selected against their targets, for the country as a whole or for a number of desired disaggregations, and then combine the results in a similar transparent comparative summary overview condensed in one table with clearly understandable information, combining simplicity with rich potential for story-telling. This is possible because S-time-distance deviations from the lines to targets are comparable across variables, fields of concern and units of comparison, which makes S-time-distance an excellent complementary analytical and presentation tool for policy and business debate.

Again, for time distance monitoring of implementation of targets SICENTER developed on www.gaptimer.eu software tool to facilitate interested users to use the method for their own data. The tool can be accessed on www.gaptimer.eu/s-t-d_monitoring_tool.html. This tool is described in Annex A3 and has been used for both Gaptimer Progress Chart and for the calculation for up to 154 developing countries for five selected MDG indicators in Chapter 5. Within the assumptions of reasonably defined lines to target the S-time-distance method of monitoring implementation of the post-2015 SDGs is operational and can be with the help of SDSN facilities further refined and distributed to complement existing methods of monitoring implementation time distance method can reinforce the use of data revolution for the SDGs.

To look back to the present situation with respect to statistical measures for analysing the disparities between the two units from the original values of time series of indicator in the database, there is a number of derived static measures like absolute difference, percentage difference, index, etc. Absolute difference in the original physical unit of measurement is very useful for a single indicator, but it becomes very difficult to compare across indicators in a multidimensional context. Then relative measures have a better possibility to be compared across indicators and units (countries, regions, socio-economic groups, etc.) and sometimes monetary approximations of the differences.

We added complementary possibility to look at differences in the parallel universe of time, adding new vocabulary in the semantics of discussing and analysing differences in the real world. SDG initiative is an important field where this additional dimension could be fruitfully applied making some aspects more transparent and understandable to people as the main potential beneficiaries and participants in the implementation.

Chapter 7

CONCLUSIONS

1. The quest for sustainability implies that we have to study well-being and development as multidimensional and long-term phenomena; people compare and assess their positions over many dimensions and over time. Analysis of disparities in development and welfare has to deal with these characteristics in a meaningful and consistent way. In this broader horizon the first line of conclusions deals with the innovation that goes beyond the present state-of-the art in measuring the degree of inequality. The theoretical concept of time distance dimension of inequality and the two novel statistical measures S-time-distance and S-time-step present a very useful approach to complement (not replace) the existing mostly static measures of inequality in many fields. The new generic time distance approach offers a new view of existing data that is exceptionally easy to understand and to communicate, and it allows for developing and exploring new hypotheses and perspectives.

2. The novel time distance methodology provides a new insight to many problems, an additional generic statistical measure, new view to many aspects of time series analysis with important technical and policy implications, and a presentation tool for policy analysis and debate expressed in time units, readily understood by policy makers, managers, media and general public.

The benefits of this new view in comparisons, competitiveness issues, benchmarking, target setting and monitoring for economic, employment, social, R&D and environment indicators at the world, OECD, EU, country, regional, city, sector, socio-economic groups, company, project, household and individual levels could be immediately applied to many indicators from many substantive fields using existing data and indicator systems from international, national, regional, business and local sources.

S-time-distance measure gives an approximate impression of the magnitude of world inequality by indicating a perception of degree of disparity from the time dimension perspective balancing the static view of the respective percentage measure. This additional insight provides a signal to politicians about the severity of the challenge at the starting point of formulating and deciding on the post-2015 agenda as well as the degree of urgency to tackle inequalities between and within countries.

3. The availability of data and faster computer processing are expanding at an unprecedented pace. The benefit for better decision making will depend critically on human interface: understanding of the information and the communication of that understanding. It is very important how people understand data and indicators. We need new data and indicators but we also need innovative concepts of looking at data and new generic statistical measures to better perceive and exploit the information available in existing data. Time is of essence in all domains, it is important both as operational and comparative metric. Time distance concept and measure delivers two important innovations in this respect.

The first is application in statistics in a more narrow interpretation, i.e. adding two generic statistic measures S-time-distance and S-time-step to the literature; with the primary application in descriptive statistics but also in goodness-of-fit issues. The strength of the time distance concept lies in the fact that

it enables additional exploitation of data and visualization for time related databases and indicator systems. This innovation opens the possibility for simultaneous two-dimensional comparisons of time series data: vertically (standard measures of static difference) as well as horizontally (Sicherl time distance), providing a new dimension of analysis to a variety of problems. New dimension is added while no earlier results are lost or replaced. We have a broader set of tools to apply to measuring inequalities and monitoring implementation.

4. The second category is the application of time distance methodology for better understanding of the information provided in statistical data; a broader concept to look at data and to compare situations, for building knowledge and for discussing policy and business issues in a new perspective. In addition to their use as descriptive statistical measures the measures have the potential to provide new understanding of a variety of situations in economics, management, research and statistics, asking new questions, formulating new hypotheses, adding new vocabulary, establishing new semantics and reaching new conclusions. The concept of time distance applies across variables, fields of concern, and units of comparison, making it an excellent analytical, presentation, and communication tool. If one does not use explicitly the broader framework outlined here, there is a possibility that in political debate and policy formulation various interest groups would intentionally look only at the specific statistical measure that will suit their particular interest.

5. Chapter 2 serves two purposes. On the one hand, it discusses the salient features of the time distance concept and methodology presenting this innovative approach for looking at time series data and in this context providing new statistical measures to discuss and evaluate the degree of inequality. Their definition is complemented with the time matrix format of presentation and visualising data over many units and over time as well as using this format as one of the approaches to calculate values of the S-time-distance and the S-time-step measures.

6. On the other hand, the empirical examples using life expectancy as the example provide also important substantive conclusions of inequalities in this important indicator of well-being and development. The long-term trend of life expectancy for Sweden from Mitchell (2003) was introduced as the benchmark trend, which allowed the calculation of time lead and lag in life expectancy for all countries to provide a perception of the magnitude of inequalities in the time distance dimension for life expectancy. For 2012 level of life expectancy for Niger one has to go back in the history of Sweden to find that level in year 1905, indicating the S-time-distance of about 107 years. This is a new way to assess the reality by applying the novel statistical methodology.

7. The life expectancy analysis confirmed the theoretical proposition that perceptions of the size of the gap in life expectancy can be very different depending on the statistical measure used. The static difference against Sweden showed that it was lower by 10 percent for China and 11 percent for Lithuania (which may appear to be small) while the time distance was around 50 and 55 years, respectively (which gives a very different perception of the magnitude of the gap). Another observation was established for S-time-step as an additional measure of dynamics. It is very easy to understand, for 1 year of increase in life expectancy in Sweden about 5.5 years were needed, for India and Bangladesh

about 3 years were needed for 1 year of increase in life expectancy at much lower level. Both measures, conventional percentage growth rate and S-time-step, are valid description of the dynamics of change.

8. Comparing disparities in gender life expectancy the parlance of S-time-distance indicates that the world average, i.e. the horizontal gap between trends of female and male life expectancy amounted to 20 years. This means that the male life expectancy in the 2005–2010 period was achieved by females already in the period 1985–1990. Gender disparity in life expectancy was 28 years for the EU27 and 35 years for the USA. The low growth rate of life expectancy indicates that this gender disparity will be very difficult to eliminate. There were also striking differences between countries. The reasons of such great dispersions in gender life expectancy are multifaceted and varied, they are important for explaining the present situation in individual countries and groups of countries.

9. Chapter 3 explores S-time-matrix visualisation as a way of presenting data across many units and years and provides exposition of relationship of conventional time series table formats and possible additional time dimension complementary formats. The intention is to complement rather than replace the existing mostly static measures to provide a broader dynamic analytical framework. This major point is not an 'either or' decision but how to build up a 'win win' situation of combining them. To use example in the text, why would we have only three formats: conventional time table, derived table of growth rates, and derived table of indices or percentages against benchmark, and why not have all 6 formats including time matrix, S-time-distance and S-time-step and use them as appropriate in given situation.

10. S-time-matrix uses innovative time matrix presentation format that enables such condensed summary visual presentation over many countries and over time. In the time matrix data are arranged by selected levels of indicators showing in which year these levels of the indicators were achieved by given country. The identifiers in level-time matrix are units and selected levels of indicator while the corresponding times are in the main body of the table. It represents the transformation of the original data in the conventional time series database in another format. Calculating these times by interpolations may pose a small problem of the degree of accuracy compared to original data but it gains additional understanding about time dimension of disparities and a good summary overview. Results of S-time-matrices are presented for world regions for 10 selected MDG indicators and for two indicators at the country level.

11. This format of level-time matrix is easily understood by everybody, at the same time it provides also a simple visualisation tool for many units over time. To calculate the S-time-matrix from original data we provide computer software Time Matrix Calculator to calculate time matrix for your own data. This was developed by Faculty of Social Sciences, University of Ljubljana and SICENTER, Ljubljana, Slovenia and is available on www.timedistance.net.

There are several methods to calculate S-time-distance and S-time-step, one of the possible approximations is to calculate the measures from the S-time-matrix for given levels of the indicator specified there. There are very many comparisons that can be seen from the STM without going into software calculation of S-time-step and S-time-distance such S-time-matrices can be used in

publications, web pages, etc. as a first-level visualisation tool to 'turn statistics into knowledge' (Sicherl, 2011a, p. 30). They can be also a rich source of information of comparison between countries depending on the interest of the user. S-time-matrix presentation format that can be useful in the debate of the starting point in setting up post-2015 Sustainable development Goals (SDG).

12. Chapter 4 opens up the very relevant specific question of application of the time distance methodology to monitoring implementation of MDG targets, and more generally to compare actual values with target values, forecasts, budgets, scenarios and plans with the time dimension perspective. Monitoring implementation of targets is an integral part of policy making at many levels and in many domains. The innovation is that implementation of targets is described in two dimensions: static deviation from the line to target at a given point in time and S-time-deviation at a given level of the indicator.

Describing the implementation of targets as leading or lagging in time against the line to well-known targets is a very useful application in the policy debate that enhances knowledge, giving data a meaning beyond values in spreadsheets. It can help us to form a new perception of the magnitude of the gap between the implementation and proclaimed targets for a given indicator as well as across more indicators.

People understand time and feel time. The story-telling and the interpretation of the deviation of actual development from the line to target with S-time-distance measure is straightforward and intuitively understandable; for each unit it deals with lead or lag of actual development against the line to their own target for the selected indicator. It is like tracking the actual arrivals in comparison with the train or bus timetable, the difference being that the concept of geographical space is in our application replaced with the indicator space. The characteristic of S-time-distance being expressed in time units means that it is easily understood by policy makers, managers, media, and general public, comparable across variables, fields of concern and units of comparison, which makes S-time-distance an excellent complementary analytical and presentation tool for policy and business debate.

13. Gapminder Progress Chart summarises the results of application of calculating S-time-distance deviation from the respective lines to the 2015 targets. The point is to ascertain if the developing world is on track, ahead, or behind schedule to achieving MDG goals. The Chart presents in a single table at a glance results for 100 cases across 10 MDG indicators and 10 units (7 world regions, Developing Regions, China, and India) expressed in time lead or time lag, providing stories of the situation from the novel time perspective. There were many positive developments in the developing countries, the situation differs among the world regions, but the overall situation shows that the number of cases ahead of the line to target (27+4) is similar to the number of cases behind (19+19).

It is important to emphasise that in absolute terms progress has been made in all selected indicators and in all world regions (though it has been quite uneven across regions as well as across countries within the regions). Furthermore, for countries with delays the application of the overall MDG targets at the regional and national cases may have been unrealistic.

Data used the Gaptimer Progress Chart are from official UN data sources, the only difference to the

official reports are that the same data source is here used to present an additional complementary time distance view of the situation. It is a transparent comparative summary overview over 100 cases, 10 indicators and fields of concern, and 10 world regions; it is condensed in one table with clearly understandable information, combining simplicity with rich potential story-telling.

14. There are many conclusions that can be derived from these results and those in Chapter 5 at the country level. They can be observed visually in the Chart, Figures and Tables. It should also be mentioned that these results depend on the data quality of national and international agencies that we are processing.

By number of indicators that have already two or more years before 2015 achieved their 2015 target the outstanding regions are China and Eastern Asia with seven cases out of 10, followed by Northern Africa and Latin America & Caribbean with 5 cases. Sub-Saharan Africa is the only world region with no case of 'Target achieved' and 6 cases where S-time-lag is 6 years or more.

Across indicators the best performance against the MDG targets was observed for Proportion of population living below $1.25 (PPP) per day, Internet users per 100 inhabitants, Proportion of population using an improved drinking water source, total, and Prevalence of underweight children under-five years of age. These indicators showed that majority of regions have already reached their 2015 targets.

15. On the other side, with largest time delay with S-time-distance deviations against their line to 2015 MDG target are IND 5.1 Maternal mortality ratio (2013), IND 2.1a Net enrolment ratio in primary education and IND 6.10b Tuberculosis patients successfully treated under short course (2011). For all three of them no world region 2015 targets were already achieved. For net enrolment ratio in primary education India was ahead of the line to target and might still reach their 2015 targets. In general this is the indicator where the discrepancy between desirability of the target and shown feasibility was most pronounced.

For time distance monitoring of implementation of targets SICENTER developed on www.gaptimer.eu software tool to facilitate interested users to use the method for their own data. The tool can be accessed on www.gaptimer.eu/s-t-d_monitoring_tool.html. This tool is described in Annex A3 and has been used for both Gaptimer Progress Chart and for the calculation for up to 154 developing countries for five selected MDG indicators in Chapter 5.

16. The situation at the country level is presented in two ways. Firstly, for five selected indicators there are figures that visualise the country values of S-time-distance deviation from the line to the 2015 targets into years ahead and years behind, the latter including countries with no change. Secondly, tables demonstrate how results of time distance monitoring of implementation of targets can look like for any number of units and indicators from different fields of concern. It can follow the implementation in this specific manner year by year, from the first year (or any other time unit) on if data on actual developments and targets are available.

This example also shows how tables for a given indicator could look in the regional reports on MDG implementation over the whole analysed period. The tables can be compressed either by columns for

given years or by rows to concentrate on selected countries of interest.

17. There is a vast number of possible comparisons and conclusions arising from the provided material that cannot be discussed here but could be productively undertaken at country and regional levels. Namely, at that level it is possible to take into account the specific policies and circumstances that might influence the outcomes. For the four selected variables more than 500 country lines of S-time-distance deviation results are provided in the Excel files in Appendix A4.

In general with respect to MDG performance the ranking for selected indicators follows the earlier order but not necessarily at the country level. The best for the values of time ahead is Internet users per 100 inhabitants, followed by Proportion of population using an improved drinking water source, total, Proportion of population using an improved sanitation facility, and Under-five mortality rate. This ranking can be already seen from the visualisation in figures.

18. Chapter 6 summarises important elements of the innovative complementary S-time-distance method for monitoring implementation of post-2015 sustainable development goals. The application is supported by two software tools, Time Matrix Calculator to apply the S-time-matrix to original official time series data tables, and the Web monitoring tool for Millennium Development Goals and other targets with S-time-distance measure. This study concludes that the proposed system for time distance monitoring implementation of targets is applicable for many areas and levels, and that the detailed empirical application to the ongoing MDGs in the study makes it immediately operational for the indicators of the post-2015 SDGs. It can be with the help of SDSN facilities further refined and distributed to complement existing methods of monitoring implementation.

19. Semantics of discussing the issues, in setting the targets and in the implementation should not be based only on static measures; it needs to be complemented by dynamic measures. Time is of essence in all domains, it is important both as operational and comparative metric. We added complementary possibility to look at differences in indicators in the parallel universe of time, adding new vocabulary in the semantics of discussing and analysing disparities in the real world. Seeing with new eyes creates new knowledge and better understanding.

Potential users of this methodology could be international and national organizations, NGOs, experts, businesses, managers, educators, students, interest groups, media, and the general public at the world, national, and sub-national levels. The time distance dimension of measuring the degree of inequality combined with well established international or national databases can test and observe what additional new insights could be established with the novel method.

20. The new generic time distance approach, which is easy to understand and to communicate, offers a new view of reality that significantly complements existing mostly static measures of inequality in many fields. In the information age this new view of the existing databases should be evaluated as an important contribution to a more efficient utilisation of the available information. These additional insights have also a transparent matter-of-fact message to politicians and the international community about the degree of urgency to tackle wide inequalities between and within countries in formulating and deciding on the post-2015 agenda.

REFERENCES

Atkinson, A. B., and A. Brandolini (2004), "Global World Income Inequality: Absolute, Relative or Intermediate?". Paper presented at the 28th General Conference of the International Association for Research in Income and Wealth, Cork, 22-28 August 2004.
http://www.iariw.org/papers/2004/brand.pdf

Cairncross, F. (1998), The Death of Distance, How the Communications Revolution will Change Our Lives, London: Orion Business Books.

Eurostat (2006), Life expectancy by sex and age [mlexpec]. Accessed January 3, 2006.

Eurostat (2012), Life table, LIFEXP - Life expectancy at given exact age (ex).

Eurostat (2013a), Life expectancy by age and sex [demo_mlexpec]. Accessed July 22, 2013.

Eurostat (2013b), Infant mortality rates.

Granger C.W.J., Jeon Y. (1997), Measuring Lag Structure in Forecasting Models – The Introduction of Time Distance, Discussion Paper 97–24, University of California, San Diego.

Granger C.W.J., Jeon Y. (2003), A time-distance criterion for evaluating forecasting models, International Journal of Forecasting, Vol. 19.

ITU (2009), ITU World Telecommunication ICT Indicators 2009, Geneva.

ITU (2010), Measuring the Information Society 2010, Geneva.

Klugman, J., Rodriguez, F., Choi, H.-J. (2011), The HDI 2010: New Controversies, Old Critiques, Research Paper 2011/1, UNDP, New York.

Kulkarni et al. 2011. "Falling behind: life expectancy in US counties from 2000 to 2007 in an international context," Population Health Metrics 2011 9:16, doi:10.1186/1478-7954-9-16.

Maddison, A. (2010), Statistics on World Population, GDP and Per Capita GDP, 1–2008 AD;
http://www.ggdc.net/MADDISON/oriindex.htm.

Mitchell, B.R. (2003), International Historical Statistics, Europe 1750-2000, Fifth Edition. Palgrave, Macmillan, New York.

OECD (2012), OECD.Stat database. Accessed on 09 May 2012.

OECD (2013), Development Co-operation Report 2013: Ending Poverty, OECD Publishing.
http://dx.doi.org/10.1787/dcr-2013-en

OECD (2014a), OECD Factbook database, OECD iLibrary. Accessed March 10 2015.
http://dx.doi.org/10.1787/data-00590-en

OECD (2014b), OECD Factbook 2014: Health, Health status, Life expectancy. Version 1 - Last updated: 04-Apr-2014.
http://dx.doi.org/10.1787/888933026791

Sicherl, P. (1973), Time Distance as a Dynamic Measure of Disparities in Social and Economic Development, Kyklos, XXVI, Fasc. 3.

Sicherl, P. (1992), "Integrating Comparisons Across Time and Space: Methodology and Applications to Disparities within Yugoslavia", Journal of Public Policy 12, 4.

Sicherl, P. (1993), Integrating Comparisons Across Time And Space, Methodology and Applications to Disparities within Yugoslavia, Studies in Public Policy, No 213. Centre for the Study of Public Policy, University of Strathclyde, Glasgow.

Sicherl, P. (1999), "A New View in Comparative Analysis", IB Revija, 1/1999, Ljubljana.

Sicherl, P. (2004a), Time distance: a missing link in comparative analysis, 28th General Conference of The International Association for Research in Income and Wealth, Cork, Ireland, August 22-28, 2004. http://www.iariw.org

Sicherl, P. (2004b), eEurope and benchmarking: a new view in benchmarking the information society indicators: Workshop Benchmarking the Information Society Data, Measurement and Methods, Cavtat, Croatia, 7-9 June.

Sicherl, P. (2006), Measuring Progress of Societies, 16th Statistical Days, Radenci November 6-8.

Sicherl, P. (2007), "The inter-temporal aspect of well-being and societal progress", Social Indicators Research 84: 231–247.

Sicherl, P. (2010), Internet users among the best performers of MDG indicators. Published 21 September 2010.
http://www.gaptimer.eu/un_millenium_development_goals_/internet_users_among_the_best_performers_of_mdg_indicators.html

Sicherl, P. (2011a), "New Understanding and Insights from Time-Series Data Based on Two Generic Measures: S-Time-Distance and S-Time-Step", OECD Statistics Working Papers, 2011/09. OECD Publishing, Paris.
http://dx.doi.org/10.1787/5kg1zpzzl1tg-en

Sicherl, P. (2011b), Visualization of 50 years of OECD countries at a glance, SICENTER, Ljubljana.
http://www.gaptimer.eu/images/stories/texts/50%20years%20of%20OECD%20countries%20at%20a%20glance.pdf,
http://www.wikiprogress.org/index.php/Visualisation_of_50_years_of_OECD_countries_at_a_glance

Sicherl, P. (2012), Time Distance in Economics and Statistics, New Insights from Existing Data. Edition echoraum, Wien.
http://www.wikiprogress.org/index.php/Time_Distance_in_Economics_and_Statistics

Sicherl, P. (2013a), A geek's guide to measuring the MDGs, Guardian Professional, The Guardian, Friday 1 March 2013 12.48 GMT, web page
http://www.guardian.co.uk/global-development-professionals-network/2013/feb/28/measuring-mdgs.

Sicherl, P. (2013b), Gender differences in life expectancy in the EU, IB Revija, XLVII, 2/2013.

Sicherl, P. (2014a), Inter-Temporal Aspect of Wellbeing. In A. C. Michalos (Ed.), Encyclopedia of Quality of Life and Well-Being Research. Dordrecht, Netherlands: Springer, p. 3353-3363.

Sicherl, P. (2014b). World Inequalities in Human Development Index (1980-2012), Printed by CreateSpace, Charleston SC.

Sicherl, P. (2014c). How Much Longer Live Women Than Men Around the Globe? Astonishing Differences between Countries, Printed by CreateSpace, Charleston SC.

Sicherl, P. (2014d). European Union at a Glance, Printed by CreateSpace, Charleston SC.

Sustainable Development Solutions Network (2013), An Action Agenda for Sustainable Development, Report for the UN Secretary-General, www.unsdsn.org.

Sustainable Development Solutions Network (2015), Indicators and a Monitoring Framework for the Sustainable Development Goals, Launching a data revolution for the SDGs. A report to the Secretary-General of the United Nations by the Leadership Council of the Sustainable Development Solutions Network. June 12, 2015.

UNDP (2013a), Human Development Report 2013, The Rise of the South: Human Progress in a Diverse World, New York.

UNDP (2013b), UNDP web page. Accessed June 6, 2013.
http://hdrstats.undp.org/en/tables/

UN (2009), MDG Report 2009, Statistical Annex, New York.

UN (2011), Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2010 Revision, CD-ROM Edition.

UN (2013a), A New Global Partnership: Eradicate Poverty and Transform Economies Through Sustainable Development. The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda, New York.

UN (2013b), Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2012 Revision, DVD Edition.

UN (2014), MDG Report 2014, Statistical Annex, New York.

UN (2015a), MDG Indicators. Accessed May 12, 2015.
http://mdgs.un.org/unsd/mdg/Data.aspx

UN (2015b), MDG Report 2015, Statistical Annex, New York.

UN (2015c), MDG Indicators. Accessed July 7, 2015.
http://mdgs.un.org/unsd/mdg/Data.aspx

UNICEF (2013), Trends in infant mortality rates 1960-2011 (September 2012).
www.childinfo.org

UNICEF (2014), UNICEF GLOBAL DATABASES, Child Mortality Estimates, Country-specific under-five mortality rate. Accessed May 15, 2015.
http://data.unicef.org/

WHO and UNICEF (2013), Progress on sanitation and drinking-water - 2013 update, France.
http://apps.who.int/iris/bitstream/10665/81245/1/9789241505390_eng.pdf

Wilber, K. (2014), What, you ask, is a human operating system?. Accessed May 22, 2014.
http://superhumanos.net/

LIST OF FIGURES AND TABLES

Figures

Tables

APPENDIX
-
ELECTRONIC SUPPLEMENTARY MATERIAL

A1 Methodology

For methodology see freely available paper by Statistics Directorate, OECD:
P. Sicherl, New Understanding and Insights from Time-Series Data Based on Two Generic Measures: S-time-distance and S-time-step; Working paper No. 44, Statistics Directorate, OECD Publishing, Paris, November 2011.
Please download the paper on http://dx.doi.org/10.1787/5kg1zpzzl1tg-en.

More detailed methodological issues and numerous applications are available in the book:
Pavle Sicherl, Time Distance in Economics and Statistics, New Insights from Existing Data,
p. 444, Echoraum, Vienna, 2012.
More information is available on wikiprogress
http://www.wikiprogress.org/index.php/Time_Distance_in_Economics_and_Statistics

The book is available on amazon.de
http://www.amazon.de/gp/product/3901941274

A2 Time Matrix Calculator to calculate time matrix for your own data

Example of input file (for indicator life expectancy at birth)

Life expectancy at birth	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium	76.2	76.3	76.5	76.5	76.8	77.0	77.3	77.5	77.6	77.7	77.9	78.1	78.2	78.3	79.0	79.1	79.5	79.9	79.8	80.1	80.3	80.7	80.5
Bulgaria	71.2	71.1	71.2	71.2	70.9	71.0	70.8	70.3	70.9	71.6	71.6	71.9	72.1	72.3	72.5	72.5	72.7	73.0	73.3	73.7	73.8	74.2	74.4
Czech Republic	71.5	72.0	72.4	72.9	73.2	73.3	74.0	74.1	74.7	74.9	75.1	75.3	75.4	75.3	75.9	76.1	76.7	77.0	77.3	77.4	77.7	78.0	78.1
Denmark	74.9	75.3	75.3	75.2	75.5	75.3	75.7	76.1	76.5	76.6	76.9	77.0	77.1	77.4	77.8	78.3	78.4	78.4	78.8	79.0	79.3	79.9	80.2
Germany	75.4	75.7	76.2	76.2	76.6	76.7	77.0	77.4	77.8	78.0	78.3	78.6	78.6	78.6	79.3	79.4	79.9	80.1	80.2	80.3	80.5	80.8	81.0
Estonia	69.9	69.8	69.1	68.1	66.6	67.7	69.9	70.1	69.7	70.6	71.1	70.9	71.4	71.9	72.4	73.0	73.2	73.2	74.4	75.3	76.0	76.6	76.7
Ireland	74.8	75.0	75.4	75.3	75.8	75.5	75.8	76.0	76.2	76.1	76.6	77.2	77.7	78.2	78.6	79.0	79.3	79.7	80.2	80.2	80.8	80.9	80.9
Greece	77.1	77.1	77.0	77.4	77.5	77.5	77.6	77.9	77.9	77.9	78.2	78.8	79.0	79.1	79.3	79.5	79.8	79.7	80.2	80.4	80.6	80.8	80.7
Spain	77.0	77.1	77.6	77.7	78.1	78.1	78.2	78.7	78.8	78.8	79.3	79.8	79.8	79.7	80.4	80.3	81.1	81.1	81.5	81.9	82.4	82.6	82.5
France	77.0	77.2	77.5	77.5	78.0	78.1	78.2	78.6	78.8	78.9	79.2	79.3	79.4	79.3	80.4	80.4	81.0	81.3	81.4	81.6	81.9	82.3	82.1
Croatia												74.6	74.7	74.6	75.4	75.3	75.9	75.8	76.0	76.3	76.7	77.2	77.3
Italy	77.1	77.1	77.5	77.8	78.0	78.3	78.7	79.0	79.1	79.6	79.9	80.3	80.4	80.1	80.9	80.9	81.4	81.6	81.7	81.8	82.2	82.4	82.4
Cyprus				77.2	77.1	77.4	77.7	77.4	77.2	78.0	77.7	79.0	78.7	79.0	79.1	78.7	80.1	79.8	80.6	81.0	81.5	81.2	81.1
Latvia													70.2	70.6	70.9	70.6	70.6	70.8	72.1	72.8	73.1	73.9	74.1
Lithuania	71.5	70.6	70.5	69.0	68.6	69.1	70.3	71.1	71.4	71.8	72.1	71.6	71.8	72.0	72.0	71.2	71.0	70.7	71.7	72.9	73.3	73.7	74.1
Luxembourg	75.7	75.7	75.3	76.0	76.7	76.8	76.8	77.1	77.3	78.0	78.0	78.0	78.1	77.9	79.2	79.6	79.4	79.5	80.7	80.8	80.8	81.1	81.5
Hungary	69.4	69.4	69.2	69.2	69.6	70.0	70.6	71.1	71.0	71.1	71.9	72.5	72.6	72.6	73.0	73.0	73.5	73.6	74.2	74.4	74.7	75.1	75.3
Malta						77.2	77.3	77.6	77.5	77.4	78.4	78.9	78.8	78.7	79.4	79.4	79.5	79.9	79.7	80.4	81.5	80.9	80.9
Netherlands	77.1	77.2	77.4	77.1	77.6	77.6	77.6	78.0	78.1	78.0	78.2	78.4	78.5	78.7	79.3	79.6	80.0	80.4	80.5	80.9	81.0	81.3	81.2
Austria	75.8	75.9	76.1	76.3	76.7	76.9	77.1	77.5	77.9	78.1	78.3	78.8	78.9	78.8	79.3	79.5	80.1	80.4	80.6	80.5	80.8	81.2	81.1
Poland	70.7	70.4	71.0	71.5	71.8	72.0	72.3	72.7	73.1	73.1	73.8	74.2	74.5	74.7	74.9	75.0	75.3	75.4	75.6	75.9	76.4	76.9	76.9
Portugal	74.1	74.1	74.7	74.6	75.5	75.4	75.3	75.8	76.0	76.2	76.8	77.2	77.4	77.5	78.4	78.2	79.0	79.3	79.5	79.7	80.1	80.7	80.6
Romania	69.9	70.1	69.5	69.5	69.4	69.3	68.8	69.1	69.9	70.6	71.2	71.1	71.0	71.4	71.9	72.3	72.8	73.3	73.5	73.6	73.8	74.6	74.5
Slovenia	73.9	73.6	73.7	73.6	74.0	74.7	75.2	75.2	75.3	75.7	76.2	76.4	76.6	76.4	77.2	77.5	78.3	78.4	79.1	79.4	79.8	80.1	80.3
Slovakia	71.1	71.1	71.5	72.0	72.5	72.4	72.9	72.9	72.8	73.2	73.3	73.6	73.8	73.8	74.2	74.1	74.5	74.6	74.9	75.3	75.6	76.1	76.3
Finland	75.1	75.5	75.7	75.9	76.7	76.7	77.0	77.2	77.4	77.6	77.8	78.2	78.3	78.6	79.0	79.1	79.5	79.6	79.9	80.1	80.2	80.6	80.7
Sweden	77.7	77.8	78.2	78.2	78.9	79.0	79.2	79.4	79.5	79.6	79.8	79.9	80.0	80.3	80.7	80.7	81.0	81.1	81.3	81.5	81.6	81.9	81.8
United Kingdom				76.2	76.8	76.7	77.0	77.2	77.4	77.5	78.0	78.2	78.3	78.4	79.0	79.2	79.5	79.7	79.8	80.4	80.6	81.0	81.0

Source: Eurostat (2013a), Life expectancy by age and sex, Total [demo_mlexpec].

Time matrix for life expectancy at birth

LEVEL	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
Spain											1990	1994	1999	2003	2006	**2009**
Italy												1994	1997	2000	2005	**2010**
France											1990	1994	1999	2004	2008	**2010**
Sweden												1992	1995	2002	**2006**	
Cyprus												2000	2005	2007	**2009**	
Netherlands												1999	2004	2006	**2010**	
Austria										1992	1996	1999	2003	2006	**2011**	
Luxembourg										1993	1997	2003	2004	2007	**2011**	
Malta												2000	2003	2008	**2011**	
United Kingdom											1996	2000	2004	2008	**2012**	
Germany										1992	1996	1999	2004	2007	**2012**	
Greece											1992	1999	2002	**2008**		
Ireland									1991	1997	2001	2003	2005	**2008**		
Finland										1993	1996	2001	2004	**2009**		
Belgium											1995	2001	2004	**2009**		
Portugal									1993	1998	2001	2004	2006	**2010**		
Slovenia								1994	1996	2000	2004	2006	2008	**2011**		
Denmark									1990	1997	2001	2004	2009	**2011**		
Czech Republic						1991	1993	1996	2000	2005	2007	**2011**				
Croatia									2004	2008	**2011**					
Poland					1992	1995	1998	2001	2005	**2009**						
Estonia	1994	1995	1996	1998	2001	2003	2005	2008	2009	**2010**						
Slovakia						1993	1999	2004	2008	**2011**						
Hungary				1995	1998	2000	2005	2008	**2011**							
Romania			1997	1998	2002	2004	2006	**2010**								
Bulgaria					1998	2002	2007	**2011**								
Latvia					2007	2008	2010	**2012**								
Lithuania			1995	1996	2007	2008	2009	**2012**								

Available software tool: Time Matrix Calculator

Faculty of Social Sciences, University of Ljubljana and SICENTER, Ljubljana, Slovenia

Methodology: Professor Pavle Sicherl
Programming: May Doušak
Testing: Jaka Hajnšek

www.timedistance.net

Required format of the input file:
Input file is an Excel file with data table in active sheet.
In the row 1 there are time units (number format) from cell B1 to the right; in the column A are unit names (text format, e.g., countries, regions, etc.) from cell A2 down.

Time matrix condenses information over many units and years (from about 550 entries in the input file), into much smaller number of about 140 entries, **which is a great advantage for presentation and visualisation providing a good summary overview of the situation at a glance**.

The year presented in **bold** show the latest presented year of the indicator for the given country. It can help to quickly observe whether there was a noticeable decrease in later years in the observed period.

A3 Web monitoring tool for Millennium Development Goals and other targets with S-time-distance measure

The purpose of the tool is to empower a broad range of stakeholders in Europe and in the world with an excellent presentation and communication tool that is easily understood by policy makers, experts, managers, media, and general public, it can support decision-making as well as influence public opinion.

The main function of the tool is to calculate the lead or lag in time for tracking implementation of targets at the world, regional, national, sub-national or business levels (e.g. EU2020 and Sustainable Development targets in the case of EU, UN Millennium Development Goals and forthcoming SDGs), or other planned, budgeted, or aid disbursement targets. Use the tool to track the implementation by using your choice of data and assumptions. The tool is available at http://www.gaptimer.eu/s-t-

d_monitoring_tool.html.

Benefits of tracking the implementation with the S-time-distance measure:

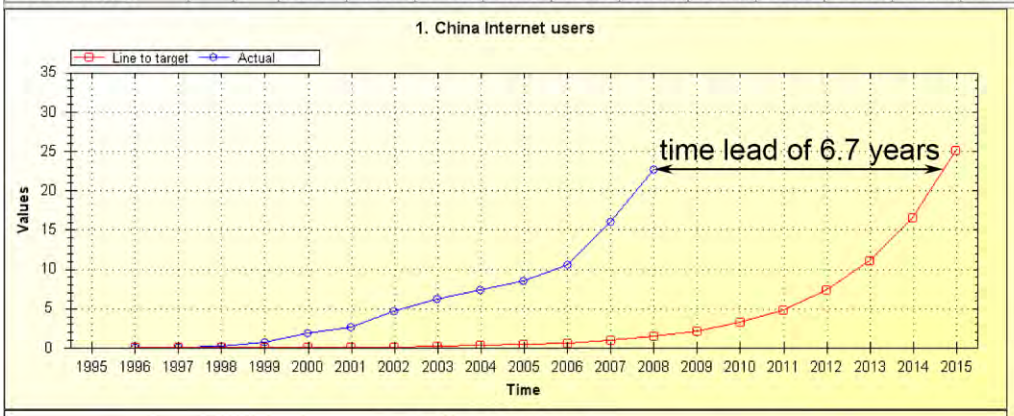
- The time distance information is at least as helpful for a proper perception of the progress in implementation or the lack of it as is the percentage difference
- It complements rather than replaces other methods
- It is comparable across variables, fields of concern and units of comparison
- This innovation provides simultaneous two-dimensional comparisons of time series data: vertically (standard measures of static difference) as well as horizontally (Sicherl time distance)
- Empirically, the perceptions of the degree of disparity may be very different in static terms and in time distance
- Thus the broader conceptual and analytical framework leads to new conclusions and richer semantics important for policy considerations

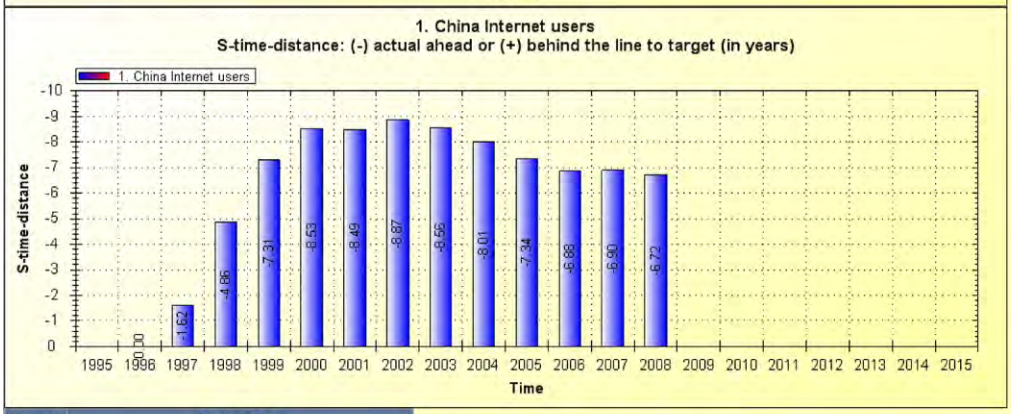
Instructions are available at http://www.gaptimer.eu/images/stories/texts/Instructions_for_demo_version_of_Stimedistance_web_application_ver_2%5B1%5D.pdf

Example of output of the tool

1. China Internet users

1. China Internet users	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Line to target		0.01	0.02	0.02	0.03	0.05	0.08	0.12	0.18	0.27	0.41	0.61	0.93	1.40	2.11	3.19	4.81	7.27	10.97	16.56	25
Actual value		0.01	0.03	0.17	0.71	1.78	2.64	4.6	6.2	7.3	8.52	10.52	16	22.6							
S-time-distance		0	-1.62	-4.86	-7.31	-8.53	-8.49	-8.87	-8.56	-8.01	-7.34	-6.88	-6.90	-6.72							
Time on LT		1996	1998.62	2002.86	2006.31	2008.53	2009.49	2010.87	2011.56	2012.01	2012.34	2012.88	2013.90	2014.72							
Deviation in [%]		0	98.68	645.61	1963.95	3329.67	3267.35	3788.42	3371.44	2607.72	1993.37	1612.52	1625.44	1514.52							





Example of output of the web tool for one unit, Internet users per 100 inhabitants for China:
in 2008 the value was 6.7 years ahead of the line to target.

Same output and graphs were made for 151 developing countries,
in 2008 133 of them were ahead of the line to target.

Legend	Description
TA	Target achieved
WTS	Actual value is worse that the starting value

A4 More detailed results for monitoring MDGs implementation

Here we provide Excel files first for 10 selected indicators for world regions and second for results of time distances in which time lead or time lag from the line to the respective MDG 2015 targets for 4 selected indicators for 125-154 developing countries. Interested readers will be able to download the Excel files over the analysed period, to analyse all individual country results and select results for those countries that they would like to compare with (e.g. by regions like African countries or simply with neighbouring countries). Similarly it would be possible to combine values for different indicators for a given country or selection of countries by interest of the user.

Following Excel files, very useful for users for presentation and/or for further calculations, are available for download at www.gaptimer.eu/MDG1.zip.

S-time-matrices for 10 selected MDG indicators across world regions, selected aggregates, China, and India:

Proportion of population living below $1.25 (PPP) per day
Prevalence of underweight children under-five years of age
Net enrolment ratio in primary education
Ratio of girls to boys in primary education
Under-five mortality rate
Maternal mortality ratio
Tuberculosis patients successfully treated under short course
Proportion of population using an improved drinking water source, total
Proportion of population using an improved sanitation facility, total
Internet users per 100 inhabitants

S-time-distance results for monitoring implementation of 4 selected MDG indicators across developing countries:

Under-five mortality rate
Proportion of population using an improved drinking water source, total
Proportion of population using an improved sanitation facility, total
Internet users per 100 inhabitants

INDEX

Index for world regions

Index for countries

ABOUT THE AUTHOR

Professor Pavle Sicherl, Founder of SICENTER and principal researcher, 1993-present, Professor of Economics, University of Ljubljana, Slovenia (1975-2003); macroeconomic adviser in the Harvard University Development Advisory Service team in Ethiopia, (1970-1974); in 1960's Deputy Director of the Yugoslav Institute of Economic Research in Belgrade.

Born February 16, 1935 in Ljubljana, Slovenian citizen. Ph.D. (economics) and Dipl.Econ., University of Ljubljana; M.A. Development Economics (Williams College, MA, USA). Speciality: growth and inequality, he introduced a new statistical measure, S-time-distance, to amend the present methods of analysing time-series data and disparities in many fields.

For this idea he received many fellowships and invitations: Senior Fulbright Research Award (Yale), London School of Economics, Institute of World Economics (Kiel), Institute for Advanced Studies (Vienna), etc. Visiting professor abroad, project leader for international and national projects, and consultant to the World Bank, OECD, UN, ILO, UNIDO, INSTRAW, ITU, EUROCHAMBRES.

Biography: Who's Who in the World, Marquis, 1991-1992 … 2015.

Website: www.gaptimer.eu

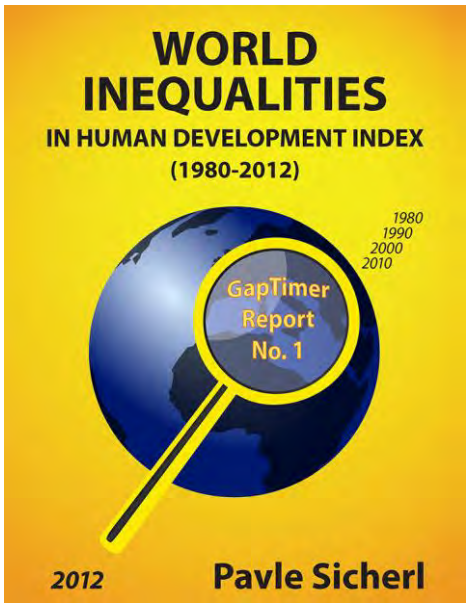
Email: pavle.sicherl@gaptimer.eu

GAPTIMER REPORTS SERIES

In the Gaptimer Report Series there are three existing report that are useful background studies to the analysis of the MDGs and their monitoring of implementation, as well as important on their own position on development issues as Human Development Index, How much longer Live Women than Men around the World, and European Union at a Glance.

Brief information on these reports is provided here. The electronic versions of the reports are available on our web site www.gaptimer.eu. The printed copies of the reports are available on Amazon.com.

No. 1 World Inequalities in Human Development Index



Gaptimer Report No. 1 'World Inequalities in Human Development Index' presents a new way of understanding and discussing development and world inequalities in a new dynamic framework. Time distance methodology can be very helpful both in the preparation of the post-2015 agenda as well as in the continuous monitoring of implementation of selected indicators later, both on the aggregate and national levels. The first step in building any strategy is the assessment of the starting position. This report analyses it for the domain of the Human Development Index (HDI), it is applicable to indicators in other domains, including MDGs.

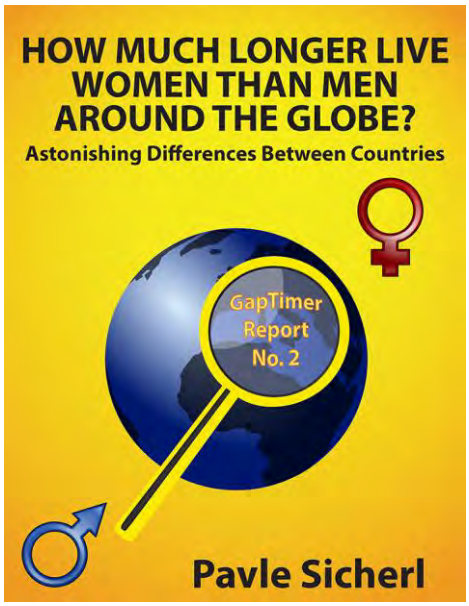
This manuscript can expand knowledge in two ways. Firstly, it offers an innovative approach for looking at disparities over many units and over time. The new time distance measure, expressed in time units, is easy to understand by everybody and offers a novel way to compare situations in economics, politics, business and statistics. The time distance concept can influence the perception and decisions of people when they are assessing their relative position in their surroundings, in the society and across countries over time.

The empirical results for the HDI over the three decades (1980-2012) provide new insights for the post-2015 agenda. S-time-distance measure (calculations based on official UNDP data) estimates HDI inequalities for each of 187 countries within their peer group. Telling new stories includes inequalities within EU27, BRICS countries, and Gulf Coordination Council countries.

Describing and perceiving inequalities in terms of percentages and ranks is not enough. Development processes take place in time and to get additional insights from existing data we complement the static measures of inequality by measuring the gap in time when two compared countries achieved the same level of the indicator (i.e., the HDI level of 0.55 was attained in China in

1996 and in India in 2011, showing S-time-distance lag of 15 years behind Sweden). For life expectancy the static difference for China against Sweden was less than 10 percent (which may appear to be small) while the time distance was around 50 years (which gives a very different perception of the magnitude of the gap, the life expectancy in China in 2012 was attained in Sweden in 1964).

No. 2 How Much Longer Live Women than Men Around the Globe?



This report concentrates on gender disparity in life expectancy at various levels (at the world level for 196 countries and some aggregates; for EU27 countries with 269 NUTS2 regions, and draws conclusion also from the study of more than 3000 USA counties). The statistical results show the gender disparity in life expectancy is so much in favour of women thus standing out against so many domains where the gender disparity is in many countries leaning in the other direction. However, analysing this gender gap of life expectancy the main focus is on the striking differences between countries around the globe.

The book offers new insights by examining gender disparity in life expectancy by using the novel generic time distance methodology. Sustainable development is by definition a long-run and multi-dimensional phenomenon. Semantics of discussing the issues, in setting the targets and in the implementation should not be based only on static measures; it needs to be complemented by dynamic measures. This methodology presents an innovation that goes beyond the present state-of-the art in measuring the degree of inequality mainly on static relative measures thus increasing the understanding of the situation in the time perspective. The time distance methodology could be very useful for analysing indicators of gender disparity in many other domains.

The empirical results concentrate on gender disparity in life expectancy around the globe (at the world level for 196 countries and some aggregates; for EU27 countries with 269 NUTS2 regions). While female life expectancy at birth is higher than that for males for 99.5 percent of the world population, there are astonishing differences among countries. For example, Estonia occupied rank 51 the world for females and 110 for males. On the other extreme, e.g. the rank for Qatar was 65 for females and only 12 for males.

The time distance measure shows the reality with new eyes. The overall life expectancy the static difference between China and Sweden was less than 10 percent (which may appear to be small) while the S-time-distance was 51 years, (which gives a very different perception of the magnitude of the gap). For gender disparity in life expectancy S-time-distance for the world average, i.e. the horizontal time gap between trends of female and male life expectancy amounted to 20 years, 28 years for the EU27 and 35 years for the USA, showing a large and persistent gap in favour of women.

No. 3 European Union at a Glance

European Union at a Glance presents an easily understandable overview of 30 selected indicators over 28 EU countries in time, which is probably the most condensed current summary picture of disparities and dynamics in the EU countries over many domains over time.

It uses innovative time matrix presentation format that enables such condensed summary visual presentation. These 30 selected indicators from many Eurostat indicators systems follow the orientation of Beyond GDP.

Time matrices presented are based on rearranging Eurostat data for 30 selected indicators from many Eurostat indicators systems like Quality of life, Sustainable Development Indicators, Digital Agenda, Headline Indicators, etc. and follow the orientation of Beyond GDP.

The voyage through 30 time matrices for 28 countries compressed a very large amount of data, expressing multidimensional nature of development and well-being, indicating both visually and in numbers that very large differences exist between EU countries with respects to levels and dynamics of indicators. Using the innovative approach of time distance methodology the telling power of S-time-matrix format provided a good summary overview at-a-glance over many domains with clear understanding to decision-makers as well as to the general public. Seeing with new eyes creates new knowledge and better understanding.

One of them is that the damage done to countries by the world financial crisis is much greater when we look for 28 countries at employment, investment share, risk of poverty, income distribution, health, etc. and not at GDP alone. Other domains show a more difficult situation:

- employment rate fell in 20 EU countries;
- in all 28 EU countries without exception share of gross investment in GDP
- decreased;
- risk of poverty as percent of total population increased in 24 EU countries;
- income distribution worsened as Gini coefficient and income quartile share ratio increased in 25 EU countries.

Statistical offices of international organisations as well as national statistical offices, NGOs, experts and students could also use the time matrix presentation to complement their usual time series data tables covering many years and units. It can be used in publications, web pages and other software as a first-level visualisation tool to ‘turn statistics into knowledge’.

World inequalities are studied comparing time series data simultaneously in two dimensions: vertically static gap at a given point in time and horizontally gap in time for a given level of the indicator (Sicherl time distance) providing a broader picture. Empirically, when comparing across indicators and periods of time, static and time distance measures of disparity can give different perceptions of inequality.

Firstly, with this innovative approach S-time-distance measure, expressed in time units, is easy to understand by everybody and **offers a novel way to compare situations in economics, politics, business, and statistics**. The time distance concept **can influence the perception and decisions of people when they are assessing their relative position** in their surroundings, in the society and across countries over time.

> *'The usual metrics for comparing two lines involves differences along the vertical axis. This can be a poor way of measuring how these trends vary in terms of time, which is on the horizontal axis.' ... 'Sicherl's several works have presented a non-technical discussion of the theory of time distance.' ... 'Observed time distance is a dynamic measure of temporal disparity between the two series, intuitively clear, readily measurable, and in transparent units which are comparable across a pairing of indicators and indicated variables. It is suggested that one should complement conventional vertical measures with horizontal measures.' (Granger and Jeon 1997)*
>
> C.W.J. Granger and Y. Jeon, University of California at San Diego

Secondly, the new generic time distance approach, which is easy to understand and to communicate, offers a new view of reality that significantly complements existing mostly static measures of inequality in many fields. The **time distance methodology** describes S-time-matrix format to view time series data across many units and over time, and two statistical measures, expressed in units of time (years): S-time-distance and S-time-step.

The main part of empirical results deals with the monitoring implementation of the 10 selected **MDG indicators over world regions and in details for five MDG indicators for 125-154 countries**. **For benchmarking the starting situation for the post-2015 discussions the world level comparisons for about 200 countries it is calculated**: how many years their recent values are behind or ahead in time against the long-term trend of Sweden as benchmark **for 4 major development indicators**.

These additional insights have also a transparent matter-of-fact message to politicians and the international community about the degree of urgency to tackle wide inequalities between and within countries in **formulating and deciding on the post-2015 agenda**. **Potential users of this methodology and results** are very many at various levels: international and national organizations, NGOs, experts, businesses, managers, educators, students, interest groups, media, and the general public.

This study offers a system for time distance monitoring implementation of targets for many areas and levels, the detailed application to present MDGs could be immediately applied for the post-2015 SDGs.