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ARTICLE

A gap analysis of SDG 3 and MDG 4/5mortality health targets in the six Arabic countries of North Africa: Egypt, Libya, Tunisia, Algeria, Morocco, and Mauritania

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ABSTRACT

Background: The United Nations Assembly adopted the Sustainable Development Goals to succeed the Millennium Development Goals in September 2015. From a European perspective, the development of health in the countries of North Africa are of special interest as a critical factor of overall social development in Europe's Mediterranean partners. In this paper, we address the mortality related SDG-3 targets, the likelihood to achieve them until 2030 and analyze how they are defined.

Methods: We projected mortality trends from 2000–2015 to 2030, based on mortality estimates by inter-agency groups and the WHO in mother and child health, non-communicable diseases, and road traffic mortality. The gap analysis compares the time remaining until 2030 to the time needed to complete the target assuming a linear trend of the respective indicator. A delay of not more than 3.75 years is considered likely to achieve the target.

Results: The SDG-3 targets of a Maternal Mortality Ratio below 70 per 100 000 live births and an U5MR below 25 per 1 000 live births have been achieved by Egypt, Libya, and Tunisia. Libya and Tunisia have also achieved the target for Newborn Mortality with Egypt close to achieving it as well. Algeria and Morocco are generally on track for most of the indicators, including deaths from non-communicable diseases and suicide rates; however, all of the countries are lagging when it comes to deadly Road Traffic Injuries for 2030. Mauritania is the only North African country which is not likely to reach the 2030 targets for any of the mortality indicators.

Conclusions: Although mortality statistics may be incomplete there is an impressive gradient from East to West showing Mauritania and deadly road traffic injuries as the most problematic areas. Given the large differences between countries baselines, we consider it preferable to set realistic targets to be achieved until 2030.

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1. Introduction

'Transforming our world', the 2030 agenda for 17 Sustainable Development Goals (SDG) was adopted by 193 members states of the United Nations in September 2015 to succeed the Millennium Development Goals (MDG) [1,2]. The Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) in 2015 defined 230 indicators to evaluate and measure the accomplishment of 169 targets until 2030 [3,4]. Health and well-being is covered in SDG-3: 'Ensure healthy lives and promote well-being for all at all ages' or in short 'Good health and Well-being' with 13 directly health-related targets and 26 indicators [5]. However, since health could be influenced by many factors in our surroundings, additional health targets have been defined – rather indirectly – under other goals [6]. Although all indicators have been chosen because of being relevant, measurable, and outcome focused as far as possible [7], there is some skepticism about their general applicability at the global level and to constitute national priorities for policymakers [8]. Therefore, each UN member state is encouraged to define its own strategies to reach the desired health targets under the given national conditions [9–11] and achieve Universal Health Coverage (UHC, SDG-3/8) which is intended to serve as a cross-cutting strategy to secure coordination of the various international organizations active in the field [12–15].

We focus in this paper on the population health status of the six Arab countries, which are part of the Near East and North Africa region (NENA) and form Europe's Mediterranean partners; they include, in geographic order from East to West: Egypt, Libya, Tunisia, Algeria, Morocco, and Mauritania.[1] According to the World Bank's income-based grouping, all of these countries are Lower and Middle-Income Countries

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(LMIC) with the exception of Libya which is classified as Upper Middle Income Country despite its instability and ongoing civil war [16]. The six countries have the same historical and cultural background and face similar conditions with impact on population health like unemployment, rapid urbanization, shortages of arable land, food and water, and a growing youth [17]. For example in 2017 the global employment-to-working age population ratio was 58.6%, whereas in the Middle East & North Africa the average was just 43.4% highlighting a situation where about half of potential workers are jobless [18]. Slow economic progress fundamentally affects investment in the health sector [19]. In addition, three countries (Egypt, Libya, and Tunisia) have passed through political instability in the recent years (Arab spring [20]). In this paper, we address the mortality related SDG-3 targets, the likelihood to achieve them until 2030 and analyze how they are defined.

2. Methods

From the indicators for the achievement of SDG-3 targets [21], we selected all but one of the mortality indicators as shown in Table 1, i.e. indicators of Maternal and Child Health (MCH), non-communicable diseases, and deadly Road Traffic Injuries (RTI). We did not include mortality from hazardous chemicals, etc. (SDG-3.9) as the 'substantial reduction' is not quantified.

The chosen quantifiable 'hard' indicators of mortality allow at least for an estimate whether the selected countries will be able to keep up with the SDG agenda and achieve its health targets within the proposed timeframe until 2030 [9,22,23].[2] With respect to the timing of progress three points in time have been chosen: the years 2000 (beginning of the MDG era), 2015 (beginning of the SDG era), and 2030 (end of the SDG era). We used mortality estimates by interagency groups [24–26] or by the WHO alone [27,28]. For the selected years the yearly World Health Statistics reports provide similar figures – with the exception of the year 2000 [here of relevance are the WHO's World Health Statistics (WHS) which include reports from 2005 (which contains data for the year 2000) [29], 2008 [30], and 2017 [31]]. The latest WHS-2018 [32] does not provide additional statistical information for the selected years. Two of the SDG mortality indicators were also included in the MDG agenda [33] with the baseline in 1990. We projected their MDG targets to 2030 as they were not achieved fully by 2015 [34]:

MDG Goal 4, Target 5: Reduce by two-thirds, between 1990 and 2015, the under-5-mortality rate.

MDG Goal 5, Target 6: Reduce by three quarters, between1990 and 2015, the maternal mortality ratio.

The likelihood of achieving the SDG targets 2030 will be determined by the indictors' time gaps, i.e. the time remaining to [35] ** achieve an agreed target. To this end we use the mathematical model of the United Nations Development Program (UNDP) used to assess progress towards the Millennium Development Goals (MDG) [36] according to the following equations:

T_r- remaining time

T_n – time needed to achieve the target (in linear progress)

G – time gap (gain or delay)

t_t – target year

t_c – year of observation

t_b – baseline year

x_b – baseline value of the indicator

x_t – target value of the indicator

x_c – observed value of the indicator

$$T_r = t_t - t_c$$

and:

$$T_n = t_t - \left[t_b + (t_t - t_b)\,\frac{x_c - x_b}{x_t - x_b}\right]$$

Then, the resulting time-gap G is calculated as:

$$G = T_r - T_n$$

A positive time-gap G indicates that the respective country is 'On Track' to achieve the target on time or even earlier; a negative value indicates that it may still be 'Likely' or even 'Unlikely' to achieve the target within the target timeframe, i.e. in 2030. A country is still considered likely to achieve the target as long as a negative value for G does not make up for less than −25% of the remaining time T_r i.e. the relative Gap G_r is:

Table 1. Quantifiable SDG-3 targets and indicators.

Target	Indicator
SDG Target 3.1: By 2030, reduce the global Maternal Mortality Ratio (MMR) to less than 70 per 100,000 livebirths	Maternal mortality ratio (3.1.1)
SDG Target 3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce Neonatal Mortality Rate (NMR) to at least as low as 12 per 1000 livebirths and Under-5-Mortality Rate (U5MR) to at least as low as 25 per 1000 live births	Under-5-mortality (3.2.1) Neonatal mortality (3.2.2)
SDG Target 3.4: By 2030, reduce by one-third premature mortality from noncommunicable diseases (NCDs) through prevention and treatment, and promote mental health and well-being	NCDs (3.4.1) Suicide (3.4.2)
SDG Target 3.6: By 2020, halve the number of global deaths and injuries from deadly Road Traffic Injuries (RTI)	Deadly Road Traffic Injuries (3.6.1)
MDG Goal 4, Target 5: Reduce by two thirds, between 1990 and 2015, the U5MR.	Under-5-mortality (MDG)
MDG Goal 5, Target 6: Reduce by three quarters, between 1990 and 2015, the MMR	Maternal mortality (MDG)

$$G_{r=}G/T_{r>} = -0.25$$

ExampMaternal Mortality Ratio of Morocco:
T_r= 2030–2015 = 15
T_n = 2030 − [2000 + (2030–2000) * (121–221/70–221)]
T_n = 2030 − [2000 + [30] * 0.66]
T_n = 2030 − [2000 + 19.9]
T_n = 10.1
G = 15–10.1 = 4.9
G_r = 4.9/15 = +0.32 >-0.25 U +1EFA *on track*

3. Results

The six North African countries (see Table 2) are very different in both population size and population density but quite similar for several demographic parameters. Mauritania is an exception insofar that it takes the worst position in the rankings, e.g. a life expectancy of about 63 years, 13 years shorter than those in Tunisia or Algeria. Table 3 summarizes the best available information on the chosen mortality indicators. Again Mauritania lags far behind for the three mortality indicators for MCH and for deadly Road Traffic Injuries. For the other two indicators – NCDs and suicide – they are closer to the others, likely due to the much shorter life expectancy. Some countries show increasing parameter values between 2000 and 2015, e.g. with regard to Deadly Road Traffic Injuries (Egypt, Libya, and Algeria) or stagnate (Tunisia and Mauritania); only Morocco demonstrates relevant progress in this area (22.8 in 2000 and 18.6 per 100 000 population in 2015).

Table 4 presents the gap analysis for the SDG target values in 2030 where a value of exactly −0.25 indicates a delay of 3.75 years in reaching the 2030 deadline which is classified as still likely reaching the target. Libya and Tunisia had reached the targets for MMR, NMR, and U5MR in 2015. Egypt reached the target 2015 for MMR and U5MR but did not yet achieve the NMR target (see Table 4). With regard to suicide mortality, only Morocco is on track to achieve the target; however, none of the six countries are on track for deadly Road Traffic Injuries. Mauritania is the only country not on track for any of the six mortality indicators. In our calculation, Morocco projects to be most on track for all parameters except for deadly Road Traffic Injuries.

As for the two analog MDG mortality indicators MMR and U5MR data are available for the MDG baseline in 1990 and for the target year. We recalculated the 2015 time gap and projected the data also to 2030 questioning whether the ambitious MDG targets can be reached in 2030 if not in 2015 (Table 5).

4. Discussion

The SDGs as a global agenda have a huge potential to change our health in many aspects: socially, economically and environmentally. Most important is to encourage people to live a healthier lifestyle in healthier environments. It is obvious that in the MDG era people's health in the six North African countries analyzed here has improved considerably between 2000 and 2015 and is likely to continue to improve although perhaps at a slower pace. The significance of the SDGs stems from their focus on the health of all people at all ages. Therefore, mortality is at the heart of the SDGs, with all its main causes. Below we discuss each of the five SDG mortality indicators considered here:

(1) The Maternal Mortality Ratio (MMR) is one of the main measures and indicators, which reflects the general health status of a population and the effectiveness of the health system. It was included in the MDG goals with the aim to be reduced worldwide by 75% [37]. Even though the international community has failed to achieve this target, a remarkable fall of 45% was registered in the period from 1990 to 2015. In Northern Africa, the proportion of pregnant women who received four or more antenatal visits increased from 50%to 89% between 1990 and 2014 [38]. MMR was again included in the SDG program as a main target [23], but with a fixed deadline – the same for all countries, irrespective whether they were below or above the ratio of 70 maternal deaths per 100.000 live births in 2015. About a year later the WHO published strategies under the SDGs called

Table 2. Country profiles.

Country (from East to West)	Egypt	Libya	Tunisia	Algeria	Morocco	Mauritania
Indicator						
Population (in thousands) 2018 [71]	99 376	6471	11 659	42 008	36 192	4 540
Population density per sq km 2018 [71]	99	4	71	18	81	4
Growth rate per year (%) 2018 [71]	1.87	1.51	1.10	1.67	1.27	2.71
Life expectancy at birth 2016 [72]	70.5	71.9	76.0	76.4	76.0	63.2*
Healthy life expectancy at birth 2016 [73]	61.1	62.3	66.3	65.5	65.3	-
Death rate per 1 000 population 2016 [74]	5.9	5.2	6.3	4.8	5.1	7.9
Population share 15–24 years (%) 2015 [75]	17.8	16.8	15.3	16.6	17.5	19.4
Nominal GDP/capita PPD 2018 [76]	11 583	19 631	11 911	15 275	8 217	3 950
Skilled Health Workforce/10 000 population 2014 [77]	22.5	90.0	48.4	31.2**	14.9	7.9***

* [78] ** 2007 *** 2009

Table 3. Selected SDG mortality indicators for the six North African countries (from East to West).

Country	Egypt	Libya	Tunisia	Algeria	Morocco	Mauritania	Source	Definition
SDG mortality indicator								
3.1.1 MMR								
1990 MDG baseline	106	39	131	216	317	859	WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Trends in maternal mortality: 1990 to 2015. Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Data files. Available from: http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/[cited 10 March 2017] [24]	Maternal mortality ratio per 100 000 live births
2000	63	17	84	170	221	813		
2015	33	9	62	140	121	602		
2030 SDG target	69	69	69	69	69	69		
2015 MDG target calculated*	27	10	33	54	79	215		
2030 MDG target projected**	8	2	16	35	30	54		
3.2.1 U5MR								
1990 (MDG baseline	85	42	52	47	81	118	UN Inter-agency Group for Child Mortality Estimation (UN IGME): Under-five-mortality rate (U5MR). Last update 18 September 2018 downloaded from http://www.childmortality.org [25]	U5MR (Under 5 mortality) (≤ 5 years) expressed as rate per 1 000 live births
2000	44	28	32	40	50	114		
2015	24	13	14	26	28	85		
2030 SDG target	25	25	25	25	25	25		
2015 MDG target calculated*	28	14	17	16	27	40		
2030 MDG target projected**	8	4	5	9	9	28		
3.2.2 NMR								
2000	22.7	14.4	19.1	21.0	27.9	43.2	UN Inter-agency Group for Child Mortality Estimation (IGME): Newborn mortality rate (NMR) 2015. Downloaded from http://data.unicef.org [26]	Neonatal mortality (≤ 28 days) expressed as rate per 1000 live births
2015	12.8	7.2	8.2	15.5	17.6	35.7		
2030 SDG target	12	12	12	12	12	12		

* It is assumed that the MMR achieved in 2015 is reduced by three-fourths and that the U5MR is reduced by two-thirds on the basis of the values in 1990, analogous to the corresponding MDG targets.
**It is assumed that the MMR achieved in 2015 can be reduced by three-fourths again by 2030 and that the U5MR can be reduced by two-thirds again, analogous to the corresponding MDG targets.
***The targeted reduction for RTI by 2030 is quantified as halving the rate in 2015 by 2020 according to the SDG. In order to have a comparable time period we repeat halving again between 2020 and 2030.

'Strategies toward ending preventable maternal mortality (EPMM)', which allowed each country to have some flexibility to set local targets, while the primary definition of the indicator remained valid. Thus, 'achievers' already in 2015 were not pressured to reduce further and countries like those in our North African case, i.e. Mauritania has no chance to reduce from the level of 602 in 2015 to <70 in 2030. Libya, despite its instability, leads the NENA countries with the lowest maternal mortality rate. Countries like Tunisia and Egypt – which have already achieved the global target – have been encouraged in the context of EPMM [1,39] to set a new target on their own to lower or even eradicate maternal mortality among their population as 75% of all maternal deaths are caused by preventable causes like post-partum hemorrhage, pre-eclampsia/eclampsia, infections, unsafe abortion [40]. However, it seems that the philosophy behind the MDG targeting to set deadlines by percentages, e.g. to reduce by 66% or 75% would have encouraged countries with higher levels as well as forced countries with very low levels like Libya to continue major efforts.

Morocco is one of the countries that experienced a sharp decrease in MMR. Even though it is still quite far from the global target the country seems to be comfortably on track to reach an MMR below 70 by 2030. This success is the result of multiple factors, which have been introduced in the Moroccan health system during recent years [41]. Examples are the reduction of barriers to access for neonatal and obstetric care, improving the quality of antenatal and delivery care, and improving the governance of safe motherhood programs [42].

The two countries with the highest MMR in this region are Algeria and Mauritania. Mauritania is extremely far from the SDGs target for 2030, and is unlikely to achieve it in time. In this case, the SGDs recommend setting a reliable local target, which the Mauritanian health system can adapt and realistically achieve [43]. However, a considerable decline in the period from 2000 to 2015 is noticed for the MMR in Mauritania. Despite the effort made by the Algerian government maternal mortality rate is still high, with the highest rates reported in the vast southern part of the country [44], mainly due to immigration from sub-Saharan countries, seeking access to essential obstetric care [45] and to the lack of online communication systems [46].

(2) The target for child health is measured by two indicators linked to each other, where NMR is part of the U5MR [47]. In North Africa, the NMR

Table 4. Results of the relative time gap (G_r) quantified for selected mortality indicators of SDG-3.

Country	Target	Egypt	Libya	Tunisia	Algeria	Morocco	Mauritania
SDG Mortality indicator							
3.1.1 MMR	69/100.000	Achieved*	Achieved*	Achieved*	−0.41	+0.33	−0.43
3.2.1 U5MR	25/1.000	Achieved*	Achieved*	Achieved*	+0.87	+0.76	−0.33
3.2.2 NMR	12/1.000	+0.85	Achieved*	Achieved*	+0.25	+0.32	−0.52
3.4.1 NCDs	−1/3	−1.87	−0.37	−0.31	+0.17	+0.48	−0.97
3.4.2 Suicide	−1/3	−2.26	−0.12	−0.85	−0.10	+0.60	−4.60
3.6.1 Road traffic	−3/4**	−1.5	−1.25	−0.97	−1.02	−0.53	−1.00

*Indicators with negative values indicate still likely achievement if >-0.25, if ≤-0.25 achievement by 2030 is considered unlikely. Colors: red indicates values ≤-0.25, yellow indicates negative values >-.25, green indicates positive values, blue indicates target was achieved 2015 or earlier.

** The targeted reduction by 2030 is quantified as halving the rate in 2015 by 2020. In order to have a comparable time period, we repeat halving again between 2020 and 2030.

Table 5. Target projections based on MDG data and targets for two MCH indicators analyzed for the SDGs as well as for the SDGs as well as for MDGs.

Country	Target 2015	Egypt	Libya	Tunisia	Algeria	Morocco	Mauritania
MDG Mortality indicator							
5.6 MMR MDG target 2015							
MMR projected 1990–2030	Reduce by 3/4	+0.24	+0.60	+0.13	−0.20	−0.65	−0.54
MMR projected 2015–2030	Reduce by 3/4	+0.09	+0.07	−0.35	−0.55	+0.05	−0.44
4.5 U5MR MDG target 2015							
U5MR projected 1990–2030	Reduce by 2/3	+0.53	+0.17	+0.29	−0.29	−0.29	−0.58
U5MR projected 2015–2030	Reduce by 2/3	+0.11	−0.41	+0.33	+0.33	+0.07	−0.33

accounts for about 17.3% of U5MR [47,48]. The three leading diseases responsible for U5MR are diarrhea, pneumonia, and malaria. The leading causes of newborn mortality are preterm birth complications, asphyxia, and sepsis [48]. Three countries are making a real progress: Egypt together with Libya and Tunisia has already achieved the target whereas Algeria is very close. However, as unattended emergencies mostly happen in the rural areas, political instability may contribute to their isolation and contribute to a backlash in progressing towards target deadlines [49]. In Egypt, the progress could be attributed to the implementation of the Integrated Management of Childhood Illness (IMCI) strategy of the WHO, which has been integrated in around 93% of primary health care since 2013 [50]. Mauritania is in the worst position and the achievement of the 2030 target is relatively far from reality. Pneumonia is the main cause of death among children with rural areas reporting the highest frequency. The availability of the Obstetric Risk Insurance package (ORI) does not seem to reflect a significant change in the last 10 years of implementation [51].

Neonatal Mortality also is a valuable indicator for health system policies and demonstrates the impact of demographic, social, and economic factors on societies [52]. In Low- and Middle-Income Countries (LMIC) rates can be more than 10 times higher than in Upper-Income Countries. The highest rates are found in Africa and Asia [53]. Most causes of newborn deaths are preventable and the high rates in these regions are mainly due to poverty and insufficiently covered vulnerable populations of mothers and newborns [54]; five of the six countries included here classify as LMIC. Libya and Tunisia have already achieved all but the NMR target in 2015; therefore, the setting of a new national goal for 2030 is mandatory. The small populations of the two countries and their high rate of literacy among the youth are among the reasons for a low NMR [55]. The neighboring countries, Egypt on the one side and Algeria and Morocco on the other, are just above the target NMR of 12 which is especially promising for Morocco with its NMR decline, as it counts in this country for almost 70% of U5MR. In general the social aspect of caring of mother and child just after delivery is popular in the Islamic culture of these countries [52,56]. The geographic factor also plays an essential role due to the vast areas needed to be covered, which is especially true in Algeria [57]. The highest NMRs are found in Mauritania with acute respiratory infection being the leading cause of death. Mauritania is one of the lowest income countries in the region, and less than half of all pregnant women give birth in health facilities. In addition, malnutrition in children could be an underlying cause for mortality, as only one in every five children has its daily food requirement met [43].

(3) The Non-Communicable Disease (NCD) mortality is a new indicator not contained in the MDG basket. NCDs are mainly cancer, cardiovascular diseases, diabetes, and chronic respiratory diseases. They account for about two-thirds of all deaths around the globe including the group of

LMIC. In the study region, NCDs account for more than 75% of all deaths between 30 and 70 years of age. The high mortality in North Africa reflects four main risk behaviors: tobacco use, physical inactivity, poor diet and harmful use of alcohol. Four of these countries have more than 30% prevalence of tobacco smoking among males, and the prevalence of smoking water pipes (Shisha) among young adults 13 to 15 years old rose to 34% in 2017. Overall more than 40% of the population has a body mass index over 25 kg/m^2. Accordingly, the whole region has a high prevalence of diabetes, which is expected to double until 2030 [58,59]. All six of the countries are to implement radical changes to cope effectively with the growing NCD mortality in order to meet the target by 2030. Effective planning is needed to implement the WHO framework of tobacco consumption control, food industries regulations and the reorientation of health systems towards more focus on NCDs as well as spreading awareness among populations [58,60].

(4) Suicide is a global public health issue and is one of the high priorities for the international community as obviously unsuccessful attempts of suicide are much more frequent. Suicide is 17th on the leading causes of death, but it is the second cause of death among children and teens just after deadly road traffic injuries. The prevalence is highest among LMIC, due to multiple factors, such as gender, age, level of education, geographic region, and sociopolitical settings [61,62]. Suicide as well as NCD mortality seems to be difficult to contain effectively in the six North African countries and to reduce the rates by one third is rather unlikely. Since anxiety and depression are leading factors in attempting suicide, these countries need urgently to improve psychological and psychiatric services [63]. However, religion plays a major supportive role keeping suicide rates low as Islam clearly forbids suicide. Therefore, in the Arabic culture suicide is considered a disgraceful act which results in victims' families hiding suicides from the public. For this reason, there is a severe lack of national data that skews these low rates [64].

(5) Deadly Road Traffic Injuries (RTI) are the leading cause of death among youth, aged 15 to 29 years old. The international community – by means of the SDGs – has set a target of lowering the RTI by half until 2020. Now RTIs are the ninth cause of death globally with high mortality especially in LMIC [65]. Libya has the highest mortality rate due to RTI in North Africa and reducing its rate in the next few years is far from likely [64]. The instability and the huge damage caused to its infrastructures during 2011–2013 are real barriers obstructing progress. However, most countries in the study fail to achieve their targets. In order to improve comparability with the other indicators, we calculated the RTI for 2030 by targeting another halving of the rate between 2020 and 2030 but none of the countries under consideration initiates sufficient effort to tighten regulations on, e.g. seat-belt use, drunk driving, obligation to wear a motorcycle helmet, and keeping within speed limits. Media awareness and public education about the magnitude of RTI could support individual behavior changes toward safer driving [66].

5. Limitations

We restricted our analysis to the SDG mortality indicators for which the target in 2030 has been quantified. Thus, we could not include indicator groups like human resources for health and access to health services. This makes it difficult to recommend specific governmental action except for improvement of incomplete death registration and therefore quality of mortality data. However, a task force of the concerned Ministries of Health with international participation might be established and come up with specific recommendations on accelerated progress towards the SDG targets. Given the limitations of morbidity and service data in some areas of the North African countries, mortality data appear to be the most reliable. There are ongoing efforts to improve the availability, reliability, and validity of health service information including death certification [67].

5.1 Summarizing success and failure

The MCH indicators (MMR, U5MR, NMR) achieved already in 2015 in Egypt, Libya, and Tunisia, whereas Algeria and Morocco are on track (except for a surprisingly high MMR in Algeria) and Mauritania, the latter unlikely to achieve any of the six indicator targets. Problems are also evident for NCDs and suicides with the exception of Algeria and Morocco (and Libya for suicide rates). All North African countries are likewise far from successfully managing a reduction of deadly Road Traffic Injuries. For the MCH indicators, there is an obvious gradient from East to West whereas for deadly Road Traffic Injuries the trend is reversed. For chronic diseases, we find a mixed picture with especially high rates in Egypt. For MMR and U5MR – the only two target indicators we can directly compare between SDG and MDG systems – we see a similar but less favorable picture for both baselines, in 1990 and 2000.

The SDGs are an agenda structured to be globally applicable to all countries; however, it has to fit

different countries priorities, capacity, and realities [6,54,68]. Flexible targets for the MCH indicators are expressed in percent reduction and therefore may have been the better option in 2015 as compared to the fixed SDG targets for MMR and U5MR, even [69] ** though reductions of 66% for U5MR and 75% for MMR during the MDG period may have been too ambitious for many countries. Nevertheless, such an approach would not have denied the poorest countries with the highest rates a feeling of success especially as their reductions in absolute terms usually outpace countries that are more advanced. An example is Mauritania which reduced MMR by 211 but requires a further reduction of 533 to the target, whereas neighboring Morocco reduced its MMR by 100 and must only reduce by 52 to achieve the target (see textbox).

The same doubts can be raised as to the usefulness of the SDG Index [66], which classifies countries from 1 to 100 (best) integrating 37 SDG health indicators at a very high level making specific lessons learnt difficult to determine. The North African countries with the exception of Mauritania (position 151, SDG Index 35) take positions in the upper middle field with indices between 68 (Tunisia) and 55 (Egypt). Likewise, the U5MR in our opinion would be more meaningful if it was calculated without the NMR, when the causality is so different between newborns, infants, and children below 5 years of age.

6. Conclusions

Most of the North African countries have achieved remarkable improvement on MCH indicators which were part of the MDGs. However, as most newly introduced SDG indicators show slow progress it is more urgent to set local targets [14,70] which would likely encourage the public health sector to engage fully. Since they have to set the targets for their populations, they are more aware of their ability and capacity for change following SDGs guidelines. Nevertheless, the huge expansion of the SDGs targets and indicators might raise some skepticism in this region, since the core of the agenda is universal health coverage.

Notes

1. We did not consider the Sudan as the country was divided in 2011 forming the independent South Sudan.
2. We did not consider the following 'soft' SDG indicators [16,35]: 3.1.2 (Skilled birth attendance), 3.3 (Fight communicable diseases), 3.5 (Prevent and treat substance abuse), 3.7 (Universal access to sexual and reproductive care), 3.8. (Achieve universal health coverage), 3.9 (Reduce illnesses and deaths from hazardous chemicals), and the additional targets 3.A (Implement the WHO framework convention on tobacco control), 3.B.1 (vaccine coverage), 3.B.2 (Development assistance to medical research & basic healthcare), 3.C (Increase health financing and support health workforce in developing countries), and 3.D (Improve early warning systems for global health risks).

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