Save the Children

FURTHER, FASTER, FAIRER

Reaching every last child with immunisation

Every child has the right to a future. Save the Children works around the world to give children a healthy start in life, and the chance to learn and to be safe. We do whatever it takes to get children the things they need – every day and in times of crisis.

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Global progress

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50% The decrease in child deaths globally between 1990 and 2015 (from 12.7 million to 5.9 million deaths)

But some children are being left behind

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The cost of immunisation services

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$32 The current cost of the full package of vaccines for a child in a Gavi-eligible country

$32.6 The cost per child of delivering immunisation services

Paying for healthcare for every last child

$86 The minimum recommended government spend per person to provide essential health services (only 16 out of 75 Countdown countries spend this; nearly half spent less than $20 per person in 2013)

15% The Abuja target for government spending on health in Africa (only nine countries have reached the target)

75% The proportion of total health expenditure in the average low-income country that comes from domestic investment

20% The recommended minimum intake of gross domestic product (GDP) in taxes (only 13% of low-income countries currently achieve this). By reforming their tax systems and improving compliance, many countries could collect much more domestic revenue, which could be used to extend immunisation and health services to every last child

Executive summary

Immunisation saves lives and is undoubtedly one of the most successful and cost-effective health interventions, with far-reaching benefits.[1] Improved coverage has contributed to the impressive 50% drop in child deaths globally between 1990 and 2015, from 12.7 million deaths to 5.9 million.[2] The benefits of immunisation will have a greater impact among excluded communities,[3] which typically have low access to healthcare and high vulnerability to disease, and where the financial burden of illness has a greater impact on household poverty. Save the Children estimates that closing the equity gap based on household wealth inequalities in 52 low- and middle-income countries could save 800,000 more lives between now and 2020.[4]

ONE IN SEVEN CHILDREN EXCLUDED FROM IMMUNISATION

There have been important improvements in coverage of immunisation services over the past decade, with 86% of children globally now receiving the most basic vaccinations.[5] But progress has recently stagnated and 19.4 million children under one year old – one in seven – are still excluded from the full benefits of immunisation.[6] These children are disproportionately found in some parts of the world and in certain countries. National data, however, does not tell the full story of inequalities. To focus on the seventh child exposes the systematic exclusion taking place within some countries.

That seventh child is being unfairly left behind because of where they were born or live. He or she is from the poorest of households, from a marginalised ethnic group, living in a neglected or rural area, or affected by conflict. In Nigeria, for example, a child from a wealthy household is 11 times more likely to be immunised than a child from a poor household, while coverage is nine times higher among Igbo children than Fulani children. These exclusions are interrelated. Children from poorer households or a specific ethnic group are often geographically concentrated in neglected areas. Globally, two-thirds of children who have not been immunised live in conflict-affected countries.[7]

The fact that children from certain groups or living in certain areas of a country are persistently left behind is not accidental. It is the direct result of policies and programmes that exclude some groups of children – whether by design or neglect – and a failure to prioritise these children and the communities and areas in which they live. These communities are missing out on the financial and human resources needed to deliver immunisation and other health services. Unless we do things differently, we will continue to fail every seventh child and further entrench systematic inequalities that leave him or her behind. This injustice cannot continue. Earlier in 2016, Save the Children launched an ambitious new global campaign to help end exclusion and ensure that Every Last Child survives and thrives.[8]

SHIFTING THE DEBATE TO A DOMESTICALLY DRIVEN AGENDA

Global attention on childhood immunisation has, to date, mainly focused on donor aid and multilateral mechanisms, such as Gavi, the Vaccine Alliance. But most of the political decisions that are excluding children are being made at national and, in some cases, sub-national levels. We argue that these domestic policy and resource choices must ensure that immunisation and other essential health services reach every last child, working towards Universal Health Coverage (UHC).

Domestic investment has played a critical role in health progress over the past decade, accounting for 75% of total health expenditure in the average low-income country.[9] As we move into the era of the Sustainable Development Goals (SDGs), there is growing recognition that domestic investment is critical to achieving universal services that leave no one behind. National governments have primary responsibility for their countries' economic and social development.[10] While aid will continue to be important for some countries, this must be a catalyst for domestically-driven change.

STRENGTHENING IMMUNISATION AS PART OF UHC

Essential health services, including immunisation, should be available to all, including the poorest and most marginalised children and communities. This must be reflected in national and sub-national strategies and actions, including immunisation policies and plans that prioritise excluded groups. These groups must be visible at all levels of policy and planning; there will need to be strong political commitment and accountability to ensure that required services are provided.

Strong health systems are needed to ensure that good-quality services are available, accessible and acceptable. This will help drive high, sustainable and equitable coverage of immunisation and other essential health services across the continuum of care, including for excluded groups. Immunisation can show the value of a UHC approach, but will require programmes to truly incorporate UHC ideals into the way they provide services, especially around prioritising the needs of the poorest and most excluded groups.

FAIR FINANCING FOR IMMUNISATION AND HEALTH

There is a need for increased and equitable public investment in immunisation and health systems. This is to ensure that programmes are sustainable and that routine immunisation and other essential health services reach every last child, especially those in the most remote and neglected areas. Investment is vital, both for the purchase of vaccines and to strengthen health systems (including cold chains) to deliver vaccines and immunisation services. However, maximising the value of investment will depend on governments creating the fiscal space to allocate additional resources to immunisation and health system strengthening.

While greater domestic responsibility and resources are important, development aid will continue to play a role in some countries for the time being. This aid must be fit for purpose to support countries to reach every last child, including responding to the changing nature of poverty and rising inequalities in middle-income countries. The other side of the coin is how that money is spent. Global funding must do more to support countries to strengthen health and immunisation systems to deliver UHC, rather than just deliver disease-specific and vertical interventions.

AN ENABLING GLOBAL ENVIRONMENT FOR COUNTRIES TO MAKE PROGRESS

Several global factors affect countries' ability to fund their own development, so these must also be addressed if they are to speed up progress on immunisation. These factors include access to affordable vaccines, and a research agenda that responds to the needs of countries where children

are left behind. More needs to be done to make sure that vaccines are affordable for countries so that immunisation gains can be expanded and sustained. Greater efforts are needed to ensure that the right vaccines and presentations are developed, in addition to innovative technologies and equipment to expand access in remote and neglected areas. Vaccine manufacturers clearly have a role to play. However, given that immunisation is a global public good, the world needs increased public investment and incentive models for research and development (R&D) that work for resource-poor settings and that will help us reach every last child.

GREATER ACCOUNTABILITY TO CHILDREN

Greater accountability to children, their families and communities is vital so that every last child can access and utilise immunisation and other essential health services. Key actors at all levels – including decision-makers, service providers, and private sector companies – must be held accountable. Unfortunately, we do not have a full picture of which children are missing out on immunisations, because many children are simply not counted among the data. However, the absence of disaggregated coverage data in many countries is compounded by the fact that millions of children are not accounted for in the first place. Globally, 230 million children under the age of five – that's one in five children – were not registered at birth. If we do not know who or where these children are, programmes and services cannot be properly designed to reach every last child. Countries must step up their efforts to make sure that every last child is counted.

Communities (including excluded groups and children themselves) and civil society organisations (CSOs) must be empowered to demand their rights and to meaningfully engage in the design and implementation of policies, programmes and budgets.[11] They must have a voice in the decisions that affect them, helping to identify immunisation gaps and solutions. They must also be empowered to hold governments accountable for delivering on their commitments.

ADDRESSING HOUSEHOLD- AND COMMUNITY-LEVEL BARRIERS

As well as supply-side issues, demand-side constraints at household and community levels (such as gender inequality and lack of knowledge about the importance of immunisation and how to access services) will need to be addressed if every last child is to be reached. Gender-related barriers drive exclusion and affect the likelihood of a child of either sex being immunised. Women are usually responsible for looking after children; therefore, any gender barriers they face are likely to affect their children too.[12] These barriers vary by country and context, but tend to be more pronounced in resource-poor settings.

Better information and communication are also critical. Where communities know their rights, are aware of the benefits of health services, know where, when and how to access services – and crucially – where they trust the service providers, vaccination coverage is higher.[13] To increase demand for and utilisation of services, families must be equipped with the right knowledge about the importance of immunisation, their right to immunisation, and where and when to access services.[14]

REACHING EVERY LAST CHILD

We must ensure that every last child – regardless of where they are born, and their level of poverty or social exclusion – has access to immunisation as an early priority in building UHC. Every child has the right to immunisation as part of their right to health. It is the responsibility of actors at all levels to ensure that all children can realise their right to immunisation, by breaking down the barriers that drive exclusion. It is possible – it just requires renewed political leadership, commitment and investment.

We must act now. At the midpoint of the 2011–2020 Global Vaccine Action Plan (GVAP) – when progress has slowed and is off track – more must be done to strengthen commitments and accelerate action.

WE CALL ON NATIONAL GOVERNMENTS TO:

- prioritise achieving universal immunisation coverage and reaching every last child, turning political commitments into action to accelerate progress
- strengthen policies and actions so that they prioritise children left behind, including reviewing policies that may inadvertently exclude some children
- strengthen immunisation systems as part of comprehensive primary healthcare (PHC), particularly in poor, under-served and excluded areas
- increase public investment in immunisation as part of growing health budgets, ensuring equitable allocation of resources to neglected regions
- improve data collection, including disaggregated data, to identify which children are being excluded so that strategies can be designed to reach them
- empower communities and civil society organisations to engage in immunisation planning, delivery, monitoring and accountability mechanisms.

WE CALL ON DEVELOPMENT PARTNERS TO:

- support countries to strengthen immunisation systems and the wider health system, and to increase domestic fiscal space for health and immunisation
- ensure strong civil society representation in monitoring and accountability processes.

WE CALL ON THE PRIVATE SECTOR TO:

- make vaccine prices affordable, for Gavi countries and middle-income countries
- increase the transparency of vaccine prices not only for Gavi-procured vaccines, but for all vaccines from all manufacturers.

WE CALL ON CIVIL SOCIETY TO:

- work with governments to support and strengthen immunisation and health systems, prioritising equity and those left behind
- hold governments accountable for delivering on health, immunisation and financing commitments
- engage in monitoring and accountability frameworks at local, national, regional and global levels.

PHOTO: IVY LAHON/SAVE THE CHILDREN

Mothers wait in line for their children to be vaccinated at a health centre in the Democratic Republic of Congo.

1 Introduction

There have been important improvements in the coverage of immunisation services over the past decade, with 86% of children globally now receiving the most basic vaccines.[1] Whereas we used to talk of "the fifth child" being left behind, we can now say that six out of every seven children are receiving life-saving, essential and cost-effective vaccinations.[2] However, this means that 19.4 million children under one year old globally – one in seven – are today excluded from the full benefits of immunisation.[3] These children are at the greatest risk of preventable diseases.

This report aims to help all stakeholders understand who and where these excluded children are. They are not randomly interspersed among other children who are being vaccinated. They are in communities that are systematically being excluded from this progress. These children are from the poorest households, from marginalised ethnic groups, live in neglected and/or rural areas of a country, and are affected by conflict. Factors such as socioeconomic circumstances, politics and policies determine access to immunisation services, and these factors play out at multiple levels – from the household to the international arena – with resulting inequalities in outcomes. While there has been progress with extending immunisation coverage over the past decade, this progress has recently stagnated. Unless there is renewed political will and commitment that translates into resources devoted to reaching every last child, we will continue to miss the seventh child and further entrench the systematic inequalities that leave him or her behind.

The fact that children from certain groups or those living in certain areas of a country are persistently left behind is not accidental. It represents a failure to prioritise these children, their communities and the areas where they live, due to policies and programmes that exclude some groups of children, whether by design or neglect. This injustice cannot continue.

Earlier in 2016, Save the Children launched an ambitious new global campaign to help end exclusion and ensure that Every Last Child survives and thrives.[4] We are calling for three guarantees for all children: (1) fair finance, including sustainable financing of and free access to essential services; (2) equal treatment, by ending discriminatory policies, norms and behaviours; and (3) accountability of decision-makers to children, their families and communities. These guarantees will help ensure that every last child has access to essential services, including immunisation.

Global attention on childhood immunisation has tended to focus on donor aid and multilateral mechanisms, such as Gavi, the Vaccine Alliance. But most of the political decisions that are excluding children are being made at national and, in some cases, sub-national levels. We argue that these domestic policy and resource choices must ensure that immunisation and other essential health services reach every last child, working towards UHC. While aid will continue to be important for some countries, this must be a catalyst for domestically-driven change.

This report also explores the global factors that affect countries' ability to fund their own development, including a fairer and more equitable global tax system, access to affordable vaccines, and a research agenda that responds to the needs of countries where children are left behind. We also look at other important issues that must be addressed for countries to make progress. These include ensuring accountability to children, and tackling the barriers (whether at household or community level) to reaching them with services, such as gender and information. We propose recommendations for governments, development partners, the private sector and civil society to drive this agenda forward.

THE POWER OF IMMUNISATION

Immunisation saves lives and is undoubtedly one of the most successful and cost-effective health interventions.[5] Improving coverage of immunisation has contributed to the impressive 50% drop in child deaths globally between 1990 and 2015, from 12.7 million deaths to 5.9 million.[6] It is estimated that in 72 low- and middle-income countries, immunisation[7] could prevent 426 million cases of illness in children and avert 6.4 million child deaths between 2011 and 2020 – that amounts to more than 116,000 illnesses prevented and 1,700 deaths averted each day.[8]

The benefits of immunisation are far-reaching. It protects children from preventable diseases, giving them a better chance of a healthier life, which means fewer illnesses and lower healthcare costs for their families and the broader health system. Children who are immunised have better physical development and are more likely to stay in school and have better educational outcomes, leading to improved future prospects for them as individuals and their communities.[9] High immunisation coverage can also bring wider benefits to society[10] by reducing transmission of, and even eliminating, some diseases.[11] The benefits of immunisation will have greater impact among excluded communities,[12] which typically have low access to healthcare, high vulnerability to disease, and where the financial burden of illness has a greater impact on household poverty. Save the Children estimates that closing the equity gap based on household wealth inequalities in 52 low- and middle-income countries could save 800,000 more lives between now and 2020.[13]

It is also good value for money. It is estimated that immunisation in 72 low- and middle-income countries could lead to savings of $6.2bn in treatment costs and $145bn in avoided productivity losses between 2011 and 2020.[14] Moreover, it provides a great return on investment – $16 for every $1 invested.[15, 16] This amount nearly triples if one takes into account the wider economic and social impacts.

The delivery of immunisation services can also provide an opportunity to increase access – and more equitable access – to other essential health services, serving as a platform to help deliver UHC through integrated primary care.

EVERY CHILD'S RIGHT TO HEALTH

Every child has the right to immunisation as part of their right to health.[17] Core human rights principles of equality and non-discrimination mean that every child should be able to access health services. It is the responsibility of all governments and the international community to realise this right. The needs and rights of excluded and marginalised groups must be prioritised. Through the SDGs, adopted in 2015, governments have committed to leave no one behind – this means making it a priority to reach the world's most excluded children (Box 1).

BOX 1: SUSTAINABLE DEVELOPMENT GOALS – LEAVE NO CHILD BEHIND

In September 2015, UN Member States agreed the 2030 Agenda for Sustainable Development, including 17 Sustainable Development Goals and 169 targets to end poverty and hunger everywhere and tackle inequalities.

The predecessors of the SDGs – the Millennium Development Goals (MDGs) – focused on average national progress. But this hid stark inequalities. For example, a country that saw a reduction in poverty on average nationally may actually have seen poverty increase for some excluded groups of children.[18] The SDGs promise to put this right, placing equity at their core and promising to "leave no one behind". The agreement that all of the targets should be met "for all nations, peoples and for all segments of society" is of paramount importance.

In the SDG era, governments will be required to provide accessible and timely data on the extent to which the goals and targets are being met for all relevant social and economic groups, including by income, sex, age, race, ethnicity, migration status, disability and geographic location. This is to ensure that the 2030 Agenda truly transforms our world for the better.

Source: Adapted from *Every Last Child: The children the world chooses to forget*[19]

UHC is intrinsic to the right to health. Countries must ensure that immunisation and other essential health services are available to all and that they can be accessed without suffering financial hardship. Save the Children argues that access to the continuum of care for women's, children's and adolescents' health services (including immunisation),[20] in particular for excluded and marginalised groups, must be a first priority on the path to UHC.[21]

GLOBAL IMMUNISATION GOALS – PROGRESS, BUT NOT ENOUGH

Recognising the importance of immunisation, 194 Member States endorsed the 2011–2020 Global Vaccine Action Plan (GVAP) at the World Health Assembly in 2012, committing to immunisation for all people in all communities (Box 2).[22] This is a commitment towards universal immunisation coverage, with equity at its core.[23] It calls for a goal of over 90% national coverage of three doses of a diphtheria-tetanus-pertussis containing vaccine (DTP3)[24] and over 80% coverage in every district by 2015, with the same target for all vaccines in national programmes by 2020. GVAP's strategic objectives call for the benefits of immunisation to be equitably extended to all people, including reducing the coverage gap between the richest and the poorest households. Other objectives include sustainable financing, strong health systems and national commitment. A number of targets and goals are also included that are specific to certain diseases or new vaccines, which will only be achieved and sustained through strong routine immunisation and health systems.

Global DTP3 coverage reached 86% in 2015, and 126 countries are already at the GVAP target of 90% national coverage. But most of the progress during the past decade was actually in the period before the GVAP started; since 2010, DTP3 coverage has only increased by 1% globally.[25]

BOX 2: GLOBAL VACCINE ACTION PLAN OBJECTIVES, 2011–2020

1. All countries commit to **immunization as a priority** – establish and sustain commitment to immunization; Inform and engage opinion leaders on the value of immunization; strengthen national capacity to formulate evidence-based policies.
2. Individuals and communities understand the **value of vaccines and demand** immunization as both their right and responsibility. Significant improvements in coverage and programme sustainability are possible if individuals and communities understand the benefits and risks of immunization.
3. The benefits of immunization are **equitably extended to all people** so that every eligible individual is immunized with all appropriate vaccines, irrespective of geographic location, age, gender, disability, educational level, socioeconomic level, ethnic group or work condition.
4. Strong immunization systems are an integral part of a **well-functioning health system** – immunization service delivery should continue to serve as a platform for providing other priority public health interventions.
5. Immunization programmes have **sustainable access to predictable funding**, quality supply and innovative technologies. Actions must be taken both within countries and globally to increase the total amount of available funding for immunization.
6. Country, regional and global **research and development** innovations maximize the benefits of immunization. Research is needed to accelerate development, licensing and uptake of vaccines that are currently in early development.

Source: Global Vaccine Action Plan[26]

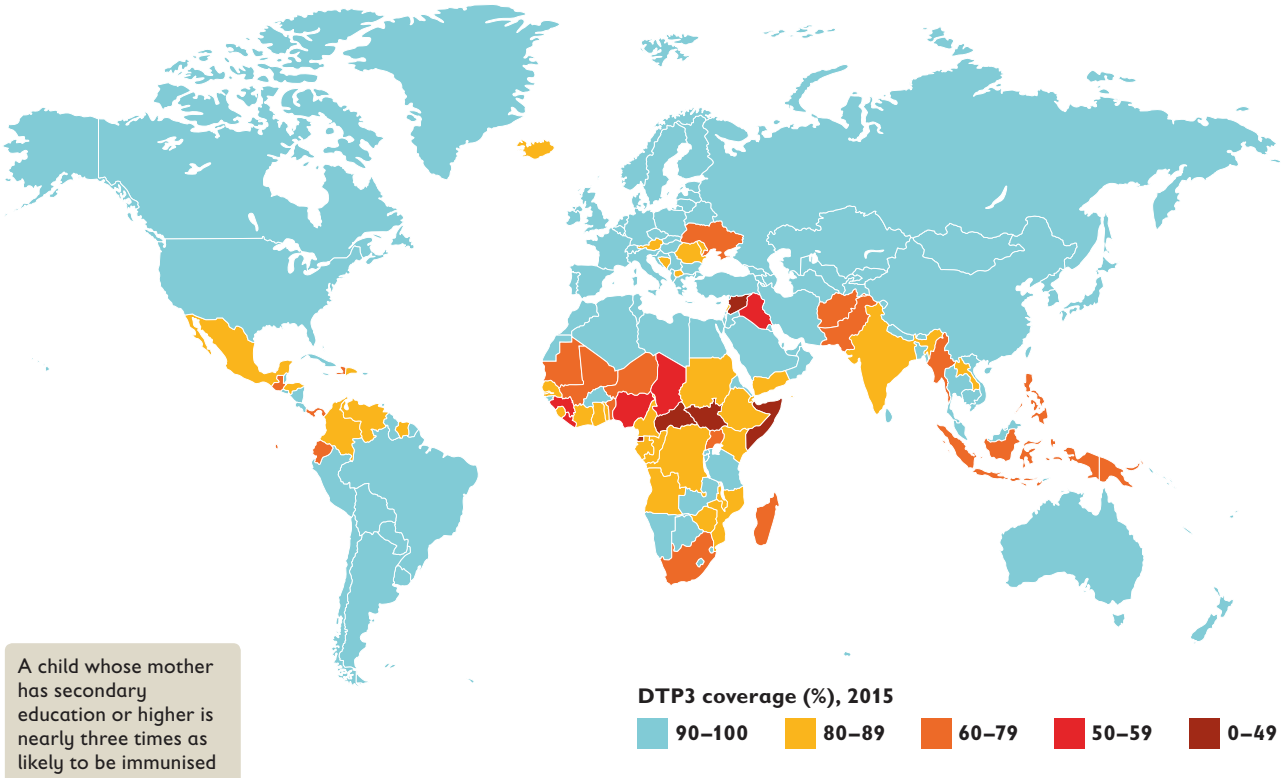
In **Cameroon**, coverage is twice as high in children from wealthy households compared to poor. Similar inequalities are experienced when comparing the Nord Ouest region and Extrême-Nord. The equity gap is widening. Health worker shortages are also an issue with only five per 10,000 people.

In the **Central African Republic**, children from wealthy households are three times more likely to be immunised. This disparity has increased by over 16% since 2006. Coverage is more than twice as high in urban than rural areas. Health worker shortage is a critical issue, with only three health workers for every 10,000 people.

In **DRC**, the gap in inequalities in immunisation coverage is narrowing, but is still 70% higher in children from wealthier households. Inequalities have decreased by nearly 34% over the past six years. Regional disparities have improved, but coverage is still twice as high in Kinshasa and Bas-Congo as it is in Equateur.

Ethiopia has made progress in increasing national coverage. However, inequalities persist, with a child from a wealthy household 2.5 times more likely to be immunised than a child from a poor household. This equity gap increased by over 27% between 2005 and 2011. Coverage is nearly nine times higher in Addis Ababa than it is in Afar.

National coverage in **Guinea** is low, with little progress. Coverage dropped following the recent Ebola outbreak. Inequalities worsened by over 20% between 2005 and 2012. Half as many children from the poorest households are immunised compared with children from wealthy households. Coverage is nearly 2.5 times higher in Forest Guinea, compared with Mamou.



A child whose mother has secondary education or higher is nearly three times as likely to be immunised in **Indonesia** compared with a child whose mother has no education. Big regional disparities can be seen, with coverage exceeding 80% in six regions (Di Yogyakarta, Bali, North Sulawesi, East Java, Central Java and East Kalimantan). But it is below 50% in others (West Sulawesi, Banten, Maluku and Papua). Inequalities based on wealth are starting to improve.

Immunisation coverage in **Lao PDR** is more than double in wealthier households and the gap has worsened. With only 10 health workers per 10,000 people, the country falls short of recommended thresholds required to deliver basic healthcare.

Immunisation coverage in **Mali** is more than twice as high amongst children from wealthier households. This gap widened by over 30% between 2006 and 2012. Coverage is nearly 70% higher in Bamako, compared with Mopti, Tombouctou/Gao, and Kidal. Availability of health workers is an issue, with only five for every 10,000 people.

Nigeria has low national coverage. Huge inequalities mean children from wealthy households are 11 times more likely to be immunised than children from poor households. This gap has increased by over 20% since 2008. Coverage in the South East of the country is nearly six times higher than it is in the North West.

A child in **Pakistan** is three times more likely to be immunised if they come from a wealthy household. These inequalities worsened by over 30% between 2006 and 2012. Regional disparities are high, with coverage over 90% in Islamabad compared with 27% in Balochistan. There are only 14 health workers for every 10,000 people.

Map based on 2015 DTP3 coverage data from WHO. Profiled countries have the highest inequalities in DTP3 coverage based on wealth according to their most recent national DHS or MICS survey (not older than 2010). There are indications of progress in some countries since their last survey, but these published reports are used for comparability. Other countries may have worse equity performance but have not been included in the list of profiled countries, due to data unavailability. Health worker statistics are based on GHWA/WHO data.

Save the Children has analysed trends and has made projections on progress based on the "business as usual" scenario, as well as on what faster progress would look like to reach 90% coverage by 2020 (Figure 1). Of the 66 countries that had national coverage below 90% in 2015, only eight will reach this target by 2020, based on current progress.

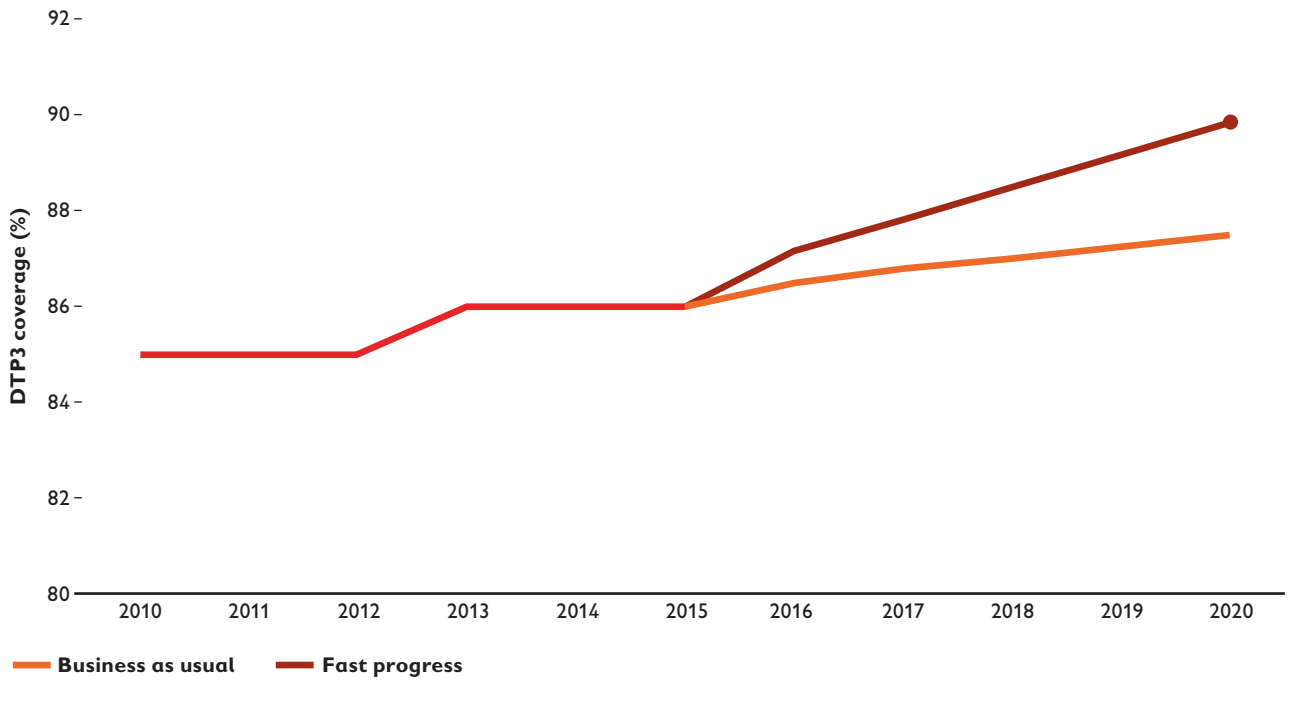
Recent assessments of GVAP progress reported that five out of six of the 2015 goal-level targets were off track, including this critical coverage target.[27] There is also a major shortcoming in terms of measuring equity in assessments of GVAP progress. This has deferred to reporting on district-level coverage only, forgoing other critical equity dimensions (eg, wealth) as originally envisaged due to a lack of available annual data. Despite equity being central to the GVAP, this has turned into rhetoric; little is being done to really measure or highlight the plight of children who are being systematically excluded from immunisation services.

COUNTRIES BEING LEFT BEHIND

Children who are not being immunised are disproportionately found in some parts of the world and in certain countries. Poorer countries have lower immunisation coverage. Across low-income countries, DTP3 coverage is 78% on average.[28] There are also disparities between regions. For example, average coverage in Africa is 77% – nearly 20% lower than in the Western Pacific and Europe. The Eastern Mediterranean (82%)[29] and South-East Asia (84%) are also falling short of global targets. Progress is being made in Africa and South-East Asia, but this would have to accelerate by over 50% in Africa and would have to double in South-East Asia to reach 90% coverage by 2020. South-East Asia and Africa also have the highest numbers of unimmunised children.[30]

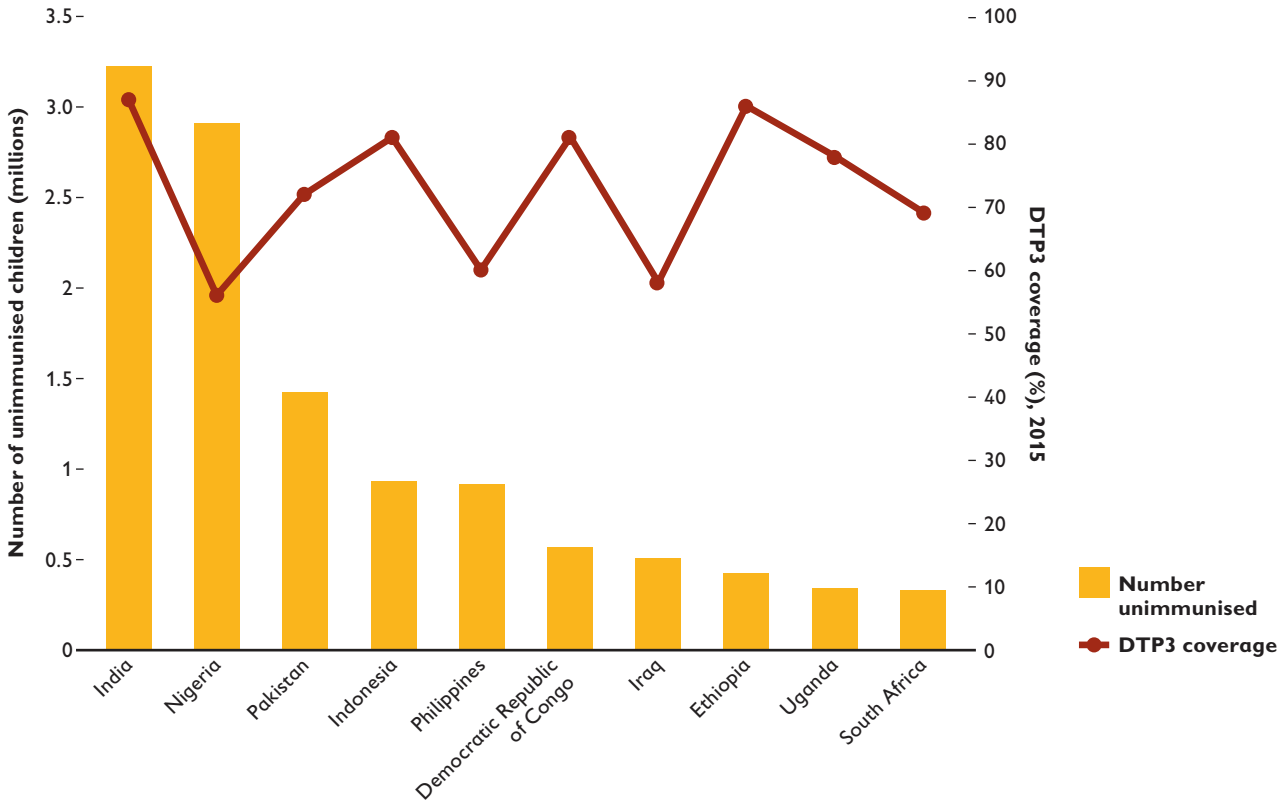
There are huge disparities in immunisation coverage between countries, with national DTP3 coverage ranging from as low as 16% in Equatorial Guinea to 99% in 29 countries. Twenty-two countries have coverage of 70% or less. In addition to Equatorial Guinea, five countries have coverage that does not exceed 50% – Ukraine (23%), South Sudan (31%), Syria (41%), Somalia (42%) and the Central African Republic (47%).[31]

FIGURE 1: GLOBAL IMMUNISATION COVERAGE AND PROJECTIONS



Source: Save the Children analysis of WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) data

FIGURE 2: COUNTRIES WITH HIGHEST NUMBERS OF UNIMMUNISED CHILDREN



Source: DTP3 coverage based on WUENIC data; number of unimmunised children calculated based on coverage figures and numbers of surviving infants[32]

Nearly 60% of unimmunised children are in just ten countries – the Democratic Republic of Congo (DRC), Ethiopia, India, Indonesia, Iraq, Nigeria, Pakistan, the Philippines, South Africa and Uganda (Figure 2).[33] Even though national coverage may be higher in some of these countries, this still means there are huge numbers of children who are not immunised. In India, for example, while national DTP3 coverage is 87%, more than 3 million children were excluded from accessing immunisation services in 2015. Nearly 3 million children in Nigeria were left behind (56% national coverage) and more than 1 million in Pakistan (72% national coverage).

CHILDREN BEING LEFT BEHIND

National data can mask inequalities in immunisation coverage within a country. To focus on the seventh child exposes the systematic exclusion that is going on within countries. That child is being unfairly left behind because of where they were born, where they live, their level of poverty or their ethnicity.

Save the Children, together with RESULTS UK, developed an Immunisation Equity Scorecard (Figure 3), which explores progress on national immunisation coverage and equitable access in 75 countries with the highest numbers of child and maternal deaths.[34] More than half of the countries in the scorecard (47) have yet to reach the global target of 90% national coverage. In fact, national coverage has worsened in 23 of these countries. Twenty of the 40 countries with available data have not made any progress in closing the coverage gap between the richest and poorest households; 18 countries are making progress in closing the gap, while two have seen no change. Thirty-five countries have not published disaggregated data, which makes it difficult to identify which children are being left behind. This in itself is a challenge, and is discussed later in this report.

FIGURE 3: IMMUNISATION EQUITY SCORECARD[35]

COUNTRY	NATIONAL COVERAGE	NATIONAL PROGRESS	EQUITABLE COVERAGE	EQUITY PROGRESS	COUNTRY	NATIONAL COVERAGE	NATIONAL PROGRESS	EQUITABLE COVERAGE	EQUITY PROGRESS
Afghanistan	●	↑	?	?	Lesotho	●	–	?	?
Angola	●	↓	?	?	Liberia	●	↓	●	↑
Azerbaijan	●	↑	?	?	Madagascar	●	↓	?	?
Bangladesh	●	–	●	↓	Malawi	●	↓	●	↑
Benin	●	↑	●	↑	Mali	●	↓	●	↓
Bolivia	●	↑	?	?	Mauritania	●	↑	?	?
Botswana	●	–	?	?	Mexico	●	↓	?	?
Brazil	●	–	?	?	Morocco	●	–	?	?
Burkina Faso	●	–	●	↑	Mozambique	●	↑	●	↑
Burundi	●	–	●	–	Myanmar	●	↓	?	?
Cambodia	●	–	●	–	Nepal	●	↑	●	↑
Cameroon	●	–	●	↓	Niger	●	↓	●	–
Central African Republic	●	↑	●	–	Nigeria	●	↑	●	–
Chad	●	↑	?	?	Pakistan	●	↓	●	↓
China	●	–	?	?	Papua New Guinea	●	↑	?	?
Comoros	●	↑	●	↑	Peru	●	–	●	↑
Congo	●	↑	●	↑	Philippines	●	↓	●	↑
Côte d'Ivoire	●	↓	●	↑	Rwanda	●	↑	●	–
Democratic People's Republic of Korea	●	↑	?	?	Sao Tome and Principe	●	–	?	?
Democratic Republic of the Congo	●	↑	●	–	Senegal	●	–	●	–
Djibouti	●	↓	?	?	Sierra Leone	●	–	●	↑
Egypt	●	–	?	?	Solomon Islands	●	↑	?	?
Equatorial Guinea	●	↓	?	?	Somalia	●	↓	?	?
Eritrea	●	↑	?	?	South Africa	●	↑	?	?
Ethiopia	●	↑	●	↓	South Sudan	●	↑	?	?
Gabon	●	↑	●	↑	Sudan	●	↑	?	?
Gambia	●	–	?	?	Swaziland	●	↑	●	–
Ghana	●	↓	●	↑	Tajikistan	●	↑	●	↑
Guatemala	●	↓	?	?	Togo	●	↑	●	–
Guinea	●	↓	●	↓	Turkmenistan	●	↑	?	?
Guinea-Bissau	●	–	?	?	Uganda	●	↓	●	–
Haiti	●	↓	●	↑	United Republic of Tanzania	●	↑	●	↑
India	●	↑	?	?	Uzbekistan	●	–	?	?
Indonesia	●	–	●	–	Vietnam	●	↑	●	↑
Iraq	●	↓	●	?	Yemen	●	↓	?	?
Kenya	●	↓	?	?	Zambia	●	↑	?	?
Kyrgyzstan	●	↑	●	?	Zimbabwe	●	↓	●	–
Lao PDR	●	↑	●	↓					

National coverage ● >=90% ● 80–89% ● <80% ? no data
National progress ↑ increasing ↓ decreasing – no change or remains above 90% despite decrease
Equitable coverage ● <10% point gap ● 10–20% point gap ● >20% point gap
Equity progress ↑ improving ↓ worsening – less than 5% point change

2 Who is being left behind?

This section paints a picture of which children are missing out on accessing immunisation services. It shows that the children who are excluded are those from the poorest households, from marginalised ethnic groups, living in under-served and/or rural areas of a country (Box 3), or affected by conflict and emergencies. We need to look more closely at where progress is being made and where certain children or areas are falling further behind, in order to ensure that policies and funding decisions address this exclusion.

Although there are some exceptions, generally speaking, children are not being excluded from accessing immunisation services simply because they are a boy or a girl.[1] While the sex of the child is not a strong determinant of immunisation, gender-related dynamics and barriers can drive exclusion and affect the likelihood of a child of either sex being immunised. This will be discussed further in section 3.

BOX 3: CHILDREN LEFT BEHIND IN INDIA[2]

India has some of the highest numbers of unimmunised children. Despite significant progress over the past decade, roughly 4 out of 10 children in India are still not fully immunised. There are significant disparities in coverage within the country. For example, only 54% of children are fully immunised in Tripura state, compared with more than 90% in Puducherry.[3]

Maharashtra – one of the wealthiest and most developed states – has the highest number of unvaccinated children, with only 56% fully immunised. This leaves behind nearly 3.8 million children who are not protected against vaccine-preventable diseases. Similarly, in Madhya Pradesh and Bihar, only 53% and 61% of children respectively are fully immunised. This means that more than 2.6 million children in Madhya Pradesh and nearly 3 million in Bihar are excluded. Other states with large numbers of unvaccinated children include Karnataka (1.8 million) and Haryana states (1 million), where full immunisation coverage stands at 62%.

Over the past decade, most Indian states have made considerable progress in improving routine immunisation coverage, but some have made little or no progress. In Tamil Nadu and Uttarakhand, for example, coverage has actually fallen. This has resulted in a doubling of the number of unvaccinated children in Tamil Nadu, to more than 1.6 million in 2015. This has occurred at a time of significant economic growth in the state – now ranked the second most developed state in India after Maharashtra.

There is a clear link between poverty and lack of access to health services in India. Children from the poorest households have much lower immunisation coverage than those from the richest, who are more than twice as likely to be fully immunised.[4] There are also considerable differences between urban and rural children's access to routine immunisation services. In Meghalaya (one of the less developed states), children in urban areas are 39% more likely to be fully immunised compared with children in rural areas. Similarly, roughly 25% more children in Madhya Pradesh and 20% more children in Manipur are fully immunised in urban areas compared with those in rural areas.

Source: Save the Children analysis of data from the fourth National Family Health Survey (NFHS-4)[5]

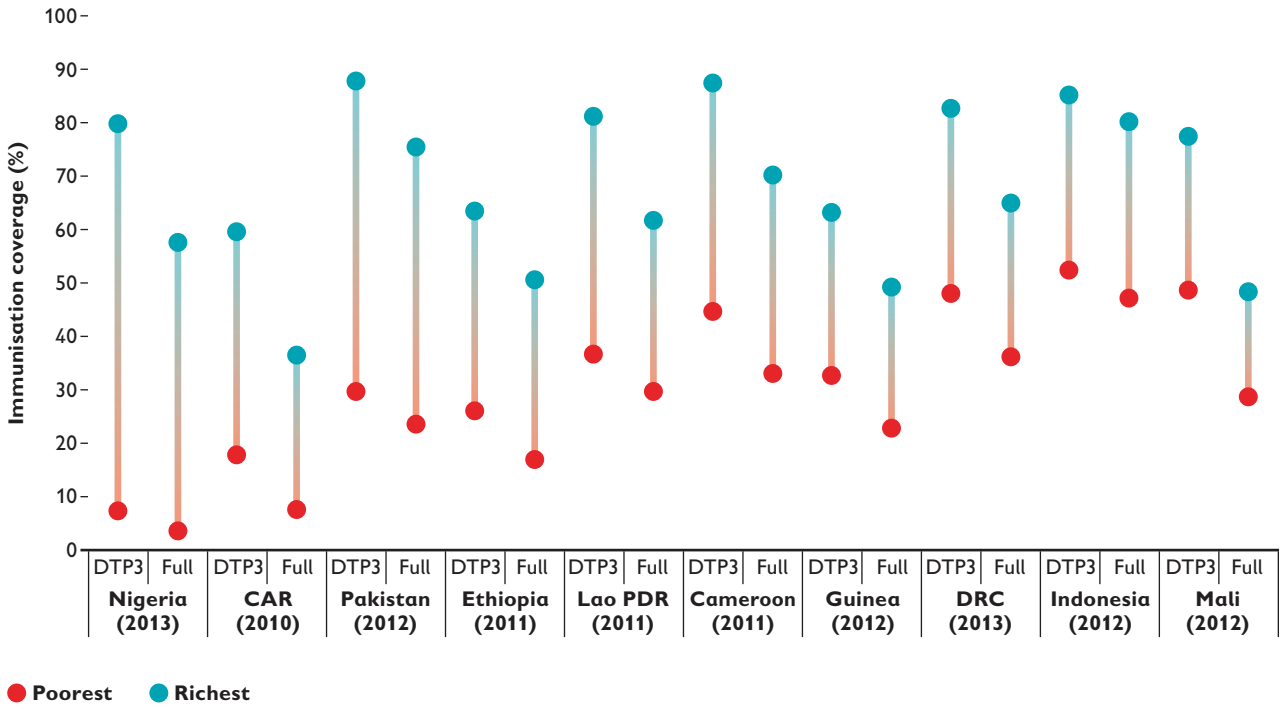
CHILDREN FROM POOR HOUSEHOLDS

Household wealth is the strongest predictor of a child being immunised,[6] and this is true irrespective of which part of a country they live in. For example, a study in India found that non-poor children in rural areas were more likely to be immunised than poor urban children.[7]

Based on 51 countries with recent available data, Nigeria, Central African Republic, Pakistan, Ethiopia, Lao PDR, Cameroon, Guinea, DRC, Indonesia and Mali have the highest inequalities in DTP3 coverage by household wealth (Figure 4).[8] In Nigeria, a child from a wealthy household is 11 times more likely to be immunised than a child from a poor household. In Central African Republic and Pakistan, for every three children immunised from a wealthy household, only one child from a poorer household is immunised. The inequality gap widens when looking at the numbers of children fully immunised with all vaccines required by the national schedules, beyond just DTP3 coverage.[9] For example, in Nigeria, the ratio increases from 11:1 to 15:1, while in Central African Republic it increases from 3:1 to 5:1.

Whole communities – often the poorest – are being excluded from immunisation services. Poorer households face a number of barriers to accessing services, including indirect costs related to transportation and lost income.[10] This means they may not be able to afford immunisation, despite services nominally being available free of charge.[11] People living in urban informal settlements may face prohibitive private sector fees to access immunisation in the absence of public services. In Kenya, for example, the government does not readily recognise informal settlements, so public provision of basic services is scarce.[12] This is largely due to the complexity of land ownership in these areas, which makes it difficult to build public health facilities. The government has tried to address this issue in Kibera, for example, by installing containers that have been refurbished and converted into clinics. Poorer households have to make tough choices and may opt for immediate needs over preventive healthcare.[13] Studies in Gabon, Haiti, Nigeria, Turkey and Uganda have found that where resources are limited, competing priorities in poorer households mean that subsistence is prioritised over taking children to be immunised.[14]

FIGURE 4: TOP 10 COUNTRIES WITH HIGHEST INEQUALITIES IN IMMUNISATION COVERAGE BASED ON WEALTH



Source: Save the Children analysis of most recent Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) data (since 2010) for the ten countries with the highest ratios between richest and poorest quintiles DTP3 coverage

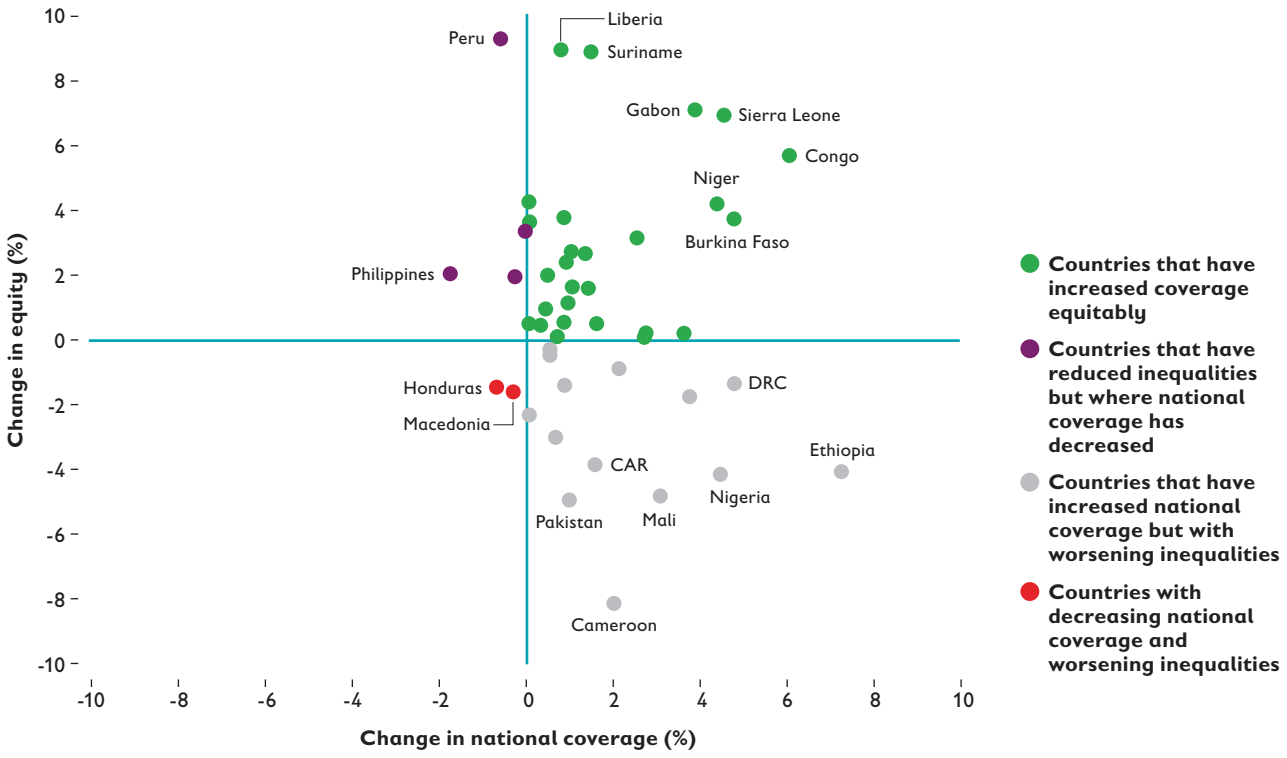
The situation may be exacerbated for children in households that face other barriers to accessing services – for instance, those in rural areas, those who belong to a marginalised group (such as migrants or certain ethnic groups) or due to gender dynamics.

THE POOR ARE FALLING FURTHER BEHIND

Some countries are making equitable progress, but in others, children from poorer households are being left behind. Figure 5 shows changes in national coverage and inequalities for the 47 countries with data available for multiple years.[15] The top-right quadrant (green dots) presents the best scenario where countries have increased coverage equitably – ie, countries that have improved national coverage and reduced inequalities in coverage; the bottom-left quadrant (red dots) shows the worst scenario – ie, countries with decreasing national coverage and worsening inequalities.

Inequalities are worsening in 19 countries. The biggest increases (of more than 20%) are in Cameroon, Pakistan, Mali, Ethiopia, Guinea and Nigeria. In Guinea, this is alongside declining national coverage (ie, the worst-case scenario). In 14 countries, inequalities between rich and poor households have widened despite rising national immunisation coverage – with excluded groups falling further behind. Of the top ten countries with the highest inequalities, half of them (Central African Republic, Ethiopia, Lao PDR, Nigeria and Pakistan) were also in the top ten based on their previous survey. Failure to address the barriers preventing poorer households from accessing immunisation services means these children will continue to be left behind.

FIGURE 5: CHANGE IN NATIONAL COVERAGE OF DTP3 AND EQUITY BASED ON WEALTH



Source: Save the Children analysis of DHS and MICS data (since 2010) for countries where a previous survey is available. Graph looks at average annual change in national coverage between 2000 and 2015 (based on WUENIC data) and change in ratios between the highest and the lowest wealth quintiles between their two most recent DHS/MICS surveys

CHILDREN FROM CERTAIN ETHNIC GROUPS

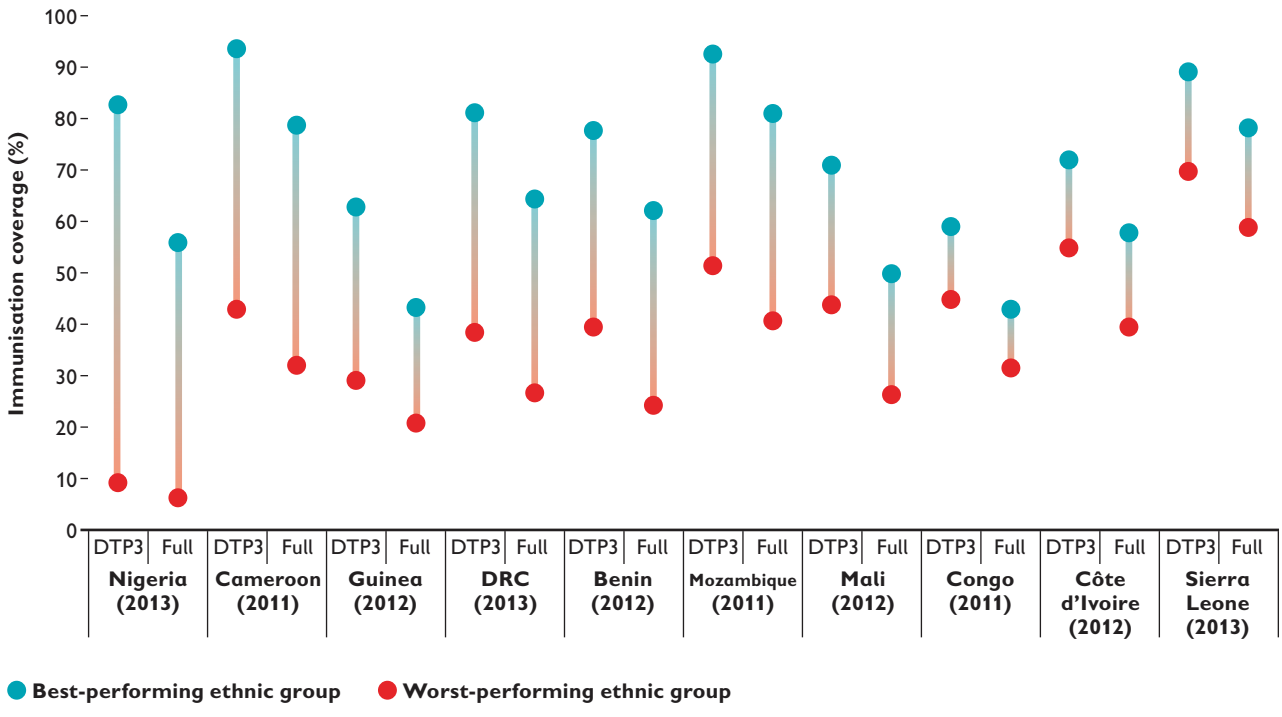
In many cases it is whole communities – such as marginalised ethnic groups – that are neglected by governments and missing out on the financial and human resources needed to deliver immunisation and other health services. Even when services are physically within reach, they may inadvertently or explicitly discriminate against certain ethnic groups – for example, if health workers do not speak the language spoken by these groups or if services are not culturally appropriate. Marginalised groups may also have weaker social networks, thereby missing out on social interactions that might encourage positive health-seeking behaviours and attendance at health services.[16]

Exclusion of certain groups within some countries has often been ignored but is pervasive and directly linked with power. According to recent estimates, around 400 million children are discriminated against and at risk of being excluded due to their ethnic, religious or indigenous group.[17] In many countries, exclusion due to ethnicity is compounded by other factors such as poverty.

Research has found that belonging to a marginalised ethnic group is associated with low access to vaccination and health services in many countries, including Angola, Bangladesh, Guinea-Bissau, Nigeria, and the Philippines.[18] More than two-thirds of families who experience health poverty in the poorest countries are from a minority ethnic group.[19] Figure 6 shows countries with high inequalities based on ethnic group, for countries with available data. In Nigeria, for example, coverage is nearly nine times higher among Igbo children than Fulani children. In Cameroon, twice as many Grassfields children are immunised compared with Biu-mandara children.

Some countries appear to have relatively low inequalities when looking at other dimensions, but higher inequalities when comparing ethnic groups. In Benin and Mozambique, for example, coverage is relatively equitable in terms of wealth and rural/urban location, yet greater inequalities emerge when looking at ethnicity.

FIGURE 6: TOP 10 COUNTRIES WITH HIGHEST INEQUALITIES IN IMMUNISATION COVERAGE BASED ON ETHNICITY



Source: Save the Children analysis of most recent DHS and MICS data (since 2010) for the ten countries with the highest ratios between the best-performing and worst-performing ethnic group for DTP3 coverage

CHILDREN LIVING IN NEGLECTED AREAS

The reasons why children are excluded from immunisation and other health services are often interrelated. Children from poorer households or a specific ethnic group are often geographically concentrated. This means that exclusion due to living in a neglected area may also be related to exclusion due to socioeconomic status or ethnicity.

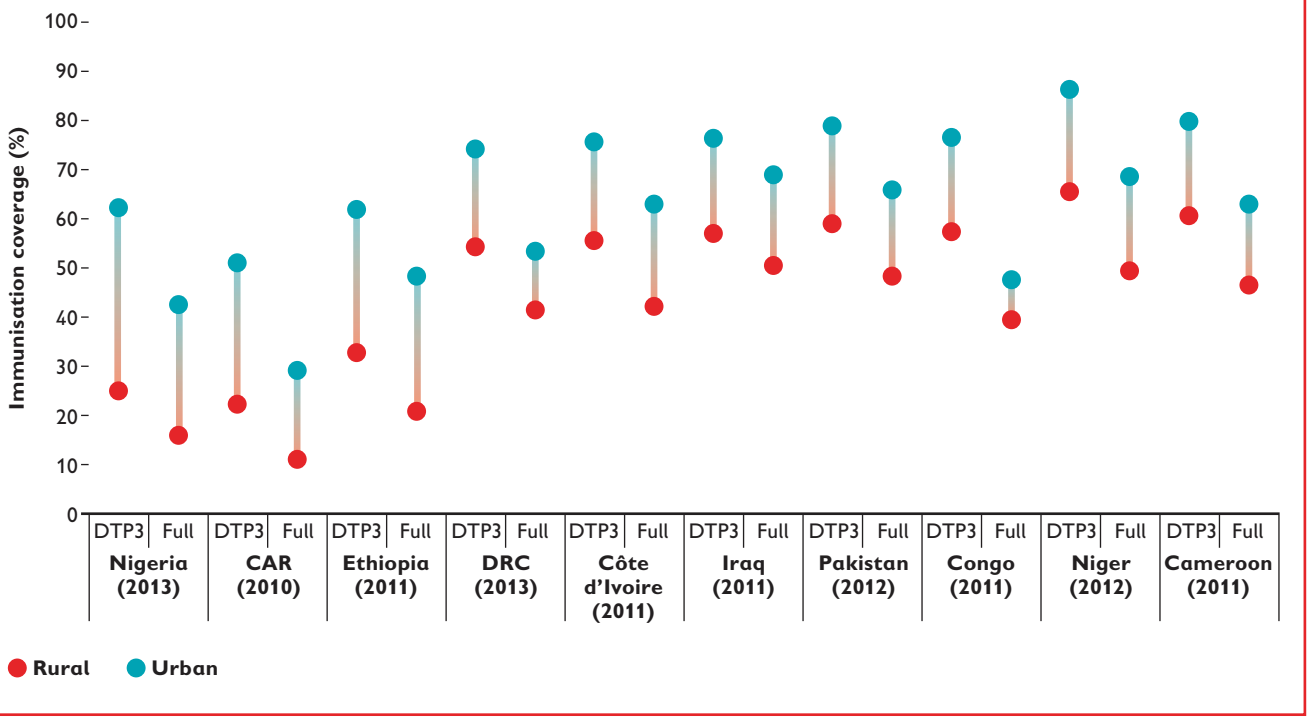
In many countries, children living in rural and remote areas are at a disadvantage when it comes to accessing immunisation. Similar to the picture in relation to wealth, inequalities in DTP3 coverage between rural and urban areas are highest in Nigeria and Central African Republic (CAR), where a child in an urban area is more than twice as likely to be immunised as a child from a rural area (Figure 7). When looking at full immunisation coverage, inequalities worsen. Coverage is 2.5 times higher in urban Nigeria and Central African Republic compared with rural parts of those countries.

Figure 8 shows changes in national coverage and inequalities between rural and urban areas. Inequalities are worsening in 16 out of 49 countries with available data. The most significant changes are in Nigeria, Central African Republic and Cameroon – all of which have increased national coverage (albeit minimally); hence, the little progress that has been experienced has been for people living in urban areas. Of the ten countries with high inequalities, seven also had the highest inequalities during their previous survey – Central African Republic, Congo, DRC, Ethiopia, Iraq, Niger and Nigeria.

It is not just rural areas that are at a disadvantage. Intra-urban inequalities are also evident, especially in highly populated urban areas (eg, as reported in Uganda[20]) and in urban informal settlements, which often lack any public services. For example, in two informal urban settlements in Nairobi, full immunisation coverage was more than 20% lower compared with Nairobi as a whole and 25% lower than the national average.[21] Similarly, in Bangladesh, a study found that full immunisation coverage was nearly 40% higher in the country as a whole compared with Dhaka's urban slums.[22] Research from China, India and Nigeria suggests that rural–urban migrants are less likely to be immunised than the general population and non-migrants in urban areas.[23]

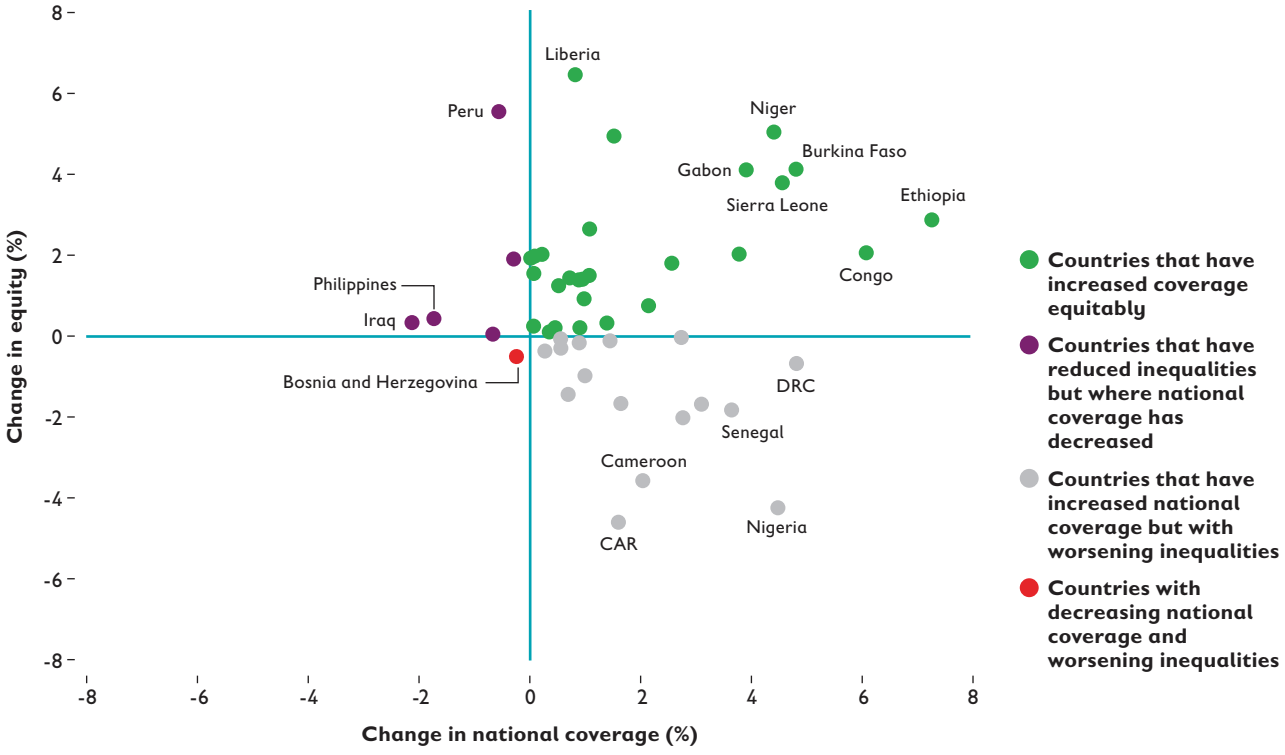
There are also huge disparities in immunisation coverage between regions (Figure 9). For example, in Ethiopia, coverage is nearly nine times higher in

FIGURE 7: TOP TEN COUNTRIES WITH HIGHEST INEQUALITIES IN IMMUNISATION COVERAGE BASED ON RURAL-URBAN LOCATION



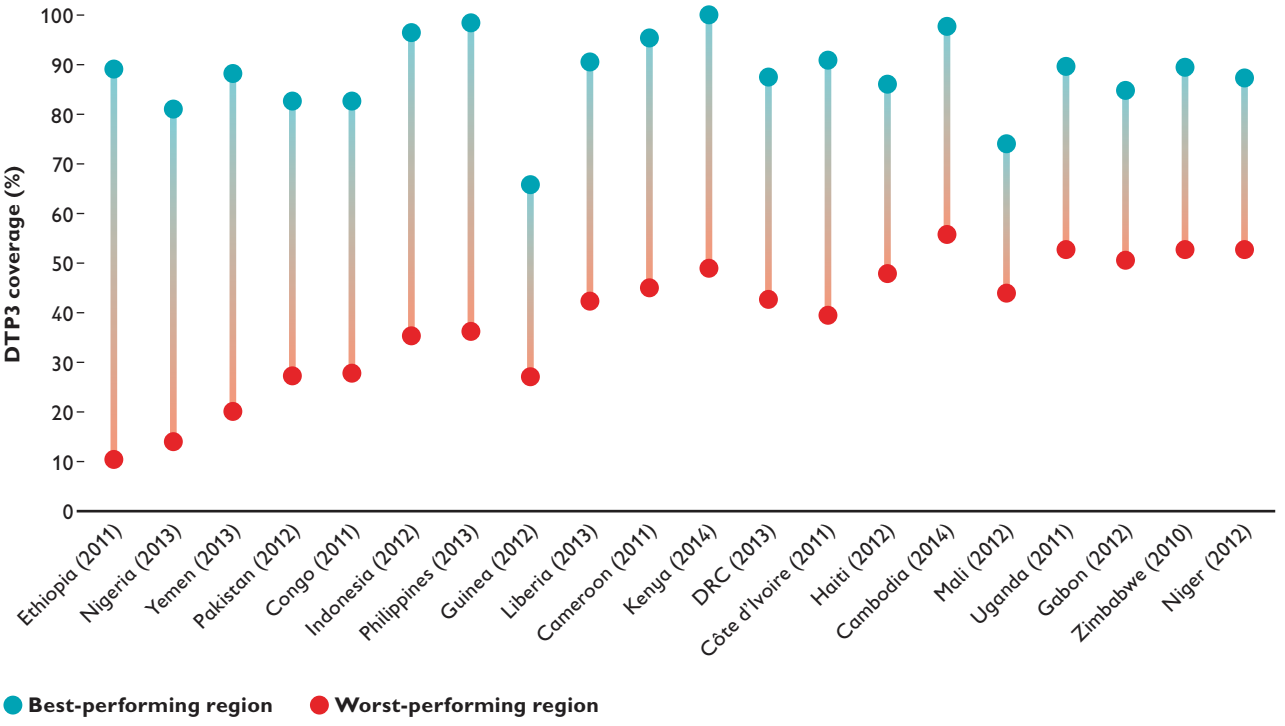
Source: Save the Children analysis of most recent DHS and MICS data (since 2010) for the ten countries with the highest ratios between urban and rural DTP3 coverage

FIGURE 8: CHANGE IN NATIONAL COVERAGE OF DTP3 AND EQUITY BASED ON URBAN–RURAL LOCATION



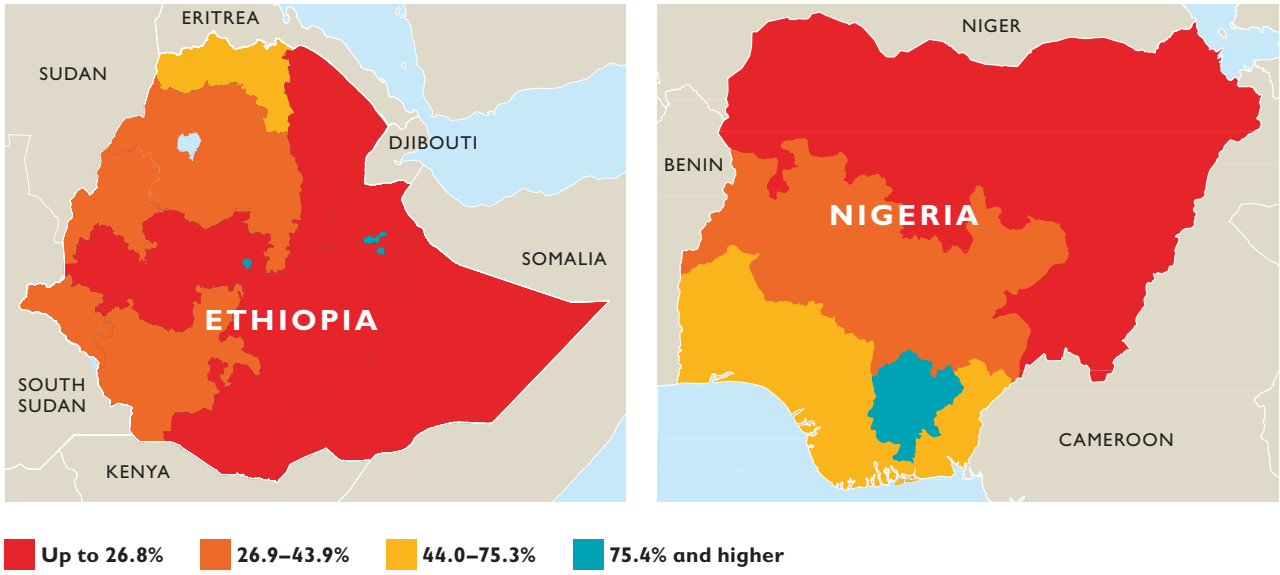
Source: Save the Children analysis of DHS and MICS data (since 2010) for countries where a previous survey is available. Graph looks at average annual change in national coverage between 2000 and 2015 (based on WUENIC data) and change in ratios between urban and rural areas between their two most recent DHS/MICS surveys

FIGURE 9: TOP 20 COUNTRIES WITH HIGHEST INEQUALITIES BETWEEN BEST-PERFORMING AND WORST-PERFORMING REGIONS



Source: Save the Children analysis of most recent DHS data (since 2010) for the 20 countries with the highest ratios between the best-performing and worst-performing regions

FIGURE 10: DTP3 COVERAGE (%) ACROSS ETHIOPIA AND NIGERIA



Source: DHS 2011 (Ethiopia) and 2013 (Nigeria)

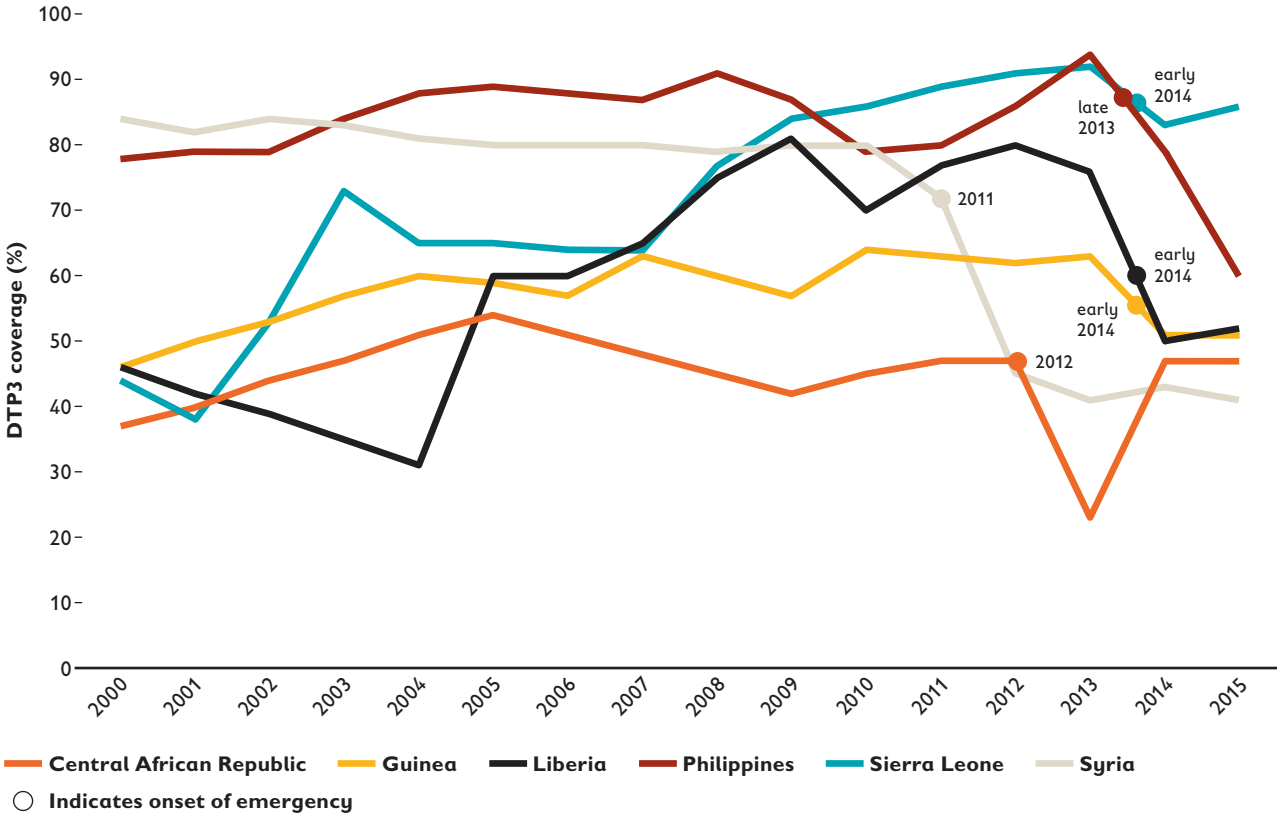
Addis Ababa than Afar, a region in the north east; in the south east of Nigeria, coverage is nearly six times higher in the north west (Figure 10). In Yemen, the ratio is nearly 4.5:1 when comparing Sanaa City and Sadah. The region where a child lives within a country can be as important as which country they are born in. For example, children in the Kagera, Mtwara, Dar es Salaam and Arusha regions of Tanzania (a low-income country) have much higher coverage than children in the Woleu-Ntem region of Gabon or Region I of the Dominican Republic (both upper-middle-income countries), where coverage is only 50% and 61% respectively.

Political decisions may lead to certain areas of a country or groups of people being prioritised while others continue to be left behind. There is often insufficient political will and action to put in place policies and systems that are sufficiently and equitably resourced and implemented, so that people in neglected areas can be reached with immunisation and other essential health services. In some cases, areas may simply be neglected, while in others they may be deemed "hard to reach" and, as a result, continue to be neglected. For example, an under-served community outside of Gbony, Nigeria, was labelled as "hard to reach" by the local government and so was not visited by the immunisation team, except during polio campaigns.[24] Decentralisation can also play a role, as some regions may not prioritise immunisation, leading to insufficient allocation of resources. This can drive disparities between regions, as has been found in Indonesia (see Indonesia Spotlight in section 3). Where a child lives should not justify inaction.

CHILDREN AFFECTED BY CONFLICT AND EMERGENCIES

Conflict, natural disasters and disease outbreaks can exacerbate children's exclusion from immunisation and other essential health services. Of all unimmunised children globally, two-thirds live in conflict-affected countries.[25] Among these, South Sudan has the highest levels of children not immunised (69%), followed by Syria (59%) and Somalia (58%). When crises occur, immunisation coverage often plummets (Figure 11). In Syria, for example, immunisation coverage dropped by nearly 50% – from 80% in 2010 to 41% in 2015 – following the onset of conflict (Box 4). In Liberia, progress on

FIGURE 11: CHANGE IN IMMUNISATION COVERAGE FOLLOWING EMERGENCY OR CONFLICT



Source: WUENIC data

immunisation before the Ebola outbreak – which had seen coverage increase from 46% in 2000 to 80% in 2012 – was undone, with national coverage dropping to a mere 40% after the outbreak, in early 2014. Similarly, in the Philippines, progress was undermined following Typhoon Haiyan in late 2013. Although coverage had reached 94% before the typhoon, it has since dropped by 36%.[26]

These situations can strain weak health systems – or even destroy systems that used to function well – and undermine the delivery of essential health services, including immunisation.[27] As well as destroying health facilities, equipment and supply chains, conflict can lead to a shortage of health workers to deliver essential services. Insecurity in these contexts can also inhibit services from reaching all children.[28] Where health services continue to function, they are likely to be overburdened, with reduced capacity. Other crises, such as disease outbreaks and disasters, can have similarly debilitating effects.[29] Where children are not immunised, this can also lead to disease outbreaks, putting lives at risk.

Conflict and emergencies can also lead to displacement, as people flee to other areas of their own country or to other countries. This creates a specific group of excluded children – children on the move (either classed as refugees or internally displaced persons). It can lead to groups of children being out of reach of immunisation programmes either due to lack of access to functioning health services, challenges from ongoing fighting and insecurity, or marginalisation within their host country. Their families may also be more vulnerable to poverty and discrimination in their new location. In these situations, collecting data may be difficult and so the true extent of the situation may not be known.

BOX 4: HEAVY TOLL OF CIVIL WAR ON ROUTINE IMMUNISATION IN SYRIA

> *"Children affected by conflict are pushed into a downward spiral of deprivation that robs them of their health and, by extension, their futures. Vaccination can help to break this vicious cycle. Immunisation is a vital service that deserves and requires protection from all parties to a conflict."*
>
> Robin Nandy, UNICEF Chief of Immunisation[30]

In Syria, routine immunisation coverage almost halved between the onset of the conflict in 2010 (80%) and 2015 (41%). More than half of the 1.8 million children born since the start of the conflict have not been immunised.[31] Polio re-emerged in 2013, after 14 years with no reported cases,[32] and measles outbreaks have also been reported.[33] Vulnerable populations in Syria and in refugee camps in neighbouring countries face disease outbreaks.[34] Syria's formerly well-functioning health system has been all but destroyed, leading to severe shortages of health workers and medicines.[35]

The government has continued to deliver routine immunisation in areas under its control (currently 25% of the country). But in contested and opposition-held areas, children are missing out on immunisation due to the unpredictable security situation and difficulties in delivering services.[36] In these areas, polio campaigns have been carried out by health workers employed by local health councils, with the support of international non-governmental organisations (NGOs) operating across borders from neighbouring countries. But because of the security situation, it has been difficult to strengthen routine immunisation through mass vaccination campaigns. There are major challenges in terms of difficulties in communication across borders and between the parties to the conflict, changing territorial control and continued security risks and inaccessibility. A lack of qualified and experienced health workers; deficient cold chain equipment; and poor funding mechanisms pose further barriers. More broadly, a lack of top-level leadership, coordination of aid, and increased external support have created further difficulties.

Despite this dire situation, a variety of innovations and interventions has been implemented in contested and opposition-held areas in an effort to improve immunisation coverage. An NGO-led Early Warning Network (ACU-EWARN) was established in sentinel sites in June 2013 to monitor vaccine-preventable diseases and polio cases. As there is no official health authority in these areas, unconventional partnerships (between NGOs and local councils, for instance) have developed to help deliver services. At the request of the World Health Organization (WHO), international and Syrian NGOs have created a task force in Turkey to manage immunisation campaigns. This has led to capacity strengthening, remote monitoring (eg, cold chain monitoring through WhatsApp), and using a Turkish laboratory to analyse samples. Some international NGOs have used platforms established through small-scale vaccination campaigns in the area to carry out social mobilisation, including cholera awareness campaigns, assessment of locations for new humanitarian assistance projects, and to share information on new health services. UNICEF now also plans to start vaccination campaigns targeting children in unreached areas who have missed out on routine immunisation – many of whom were born after the conflict started.[37]

Source: Based on information and data collected by Save the Children

3 Critical issues that must be addressed

There is no one factor that explains why a child is not immunised across different countries and contexts.[1] Rather, it is a combination of intersecting economic, social and political factors that leads to exclusion, ranging from direct discriminatory actions to a lack of action and political prioritisation. These factors play out at different levels.

Spotlight on Indonesia: Multiple drivers of exclusion

Although immunisation coverage in Indonesia has improved (currently at 81%), progress has not been equitable. Children left behind are those from poorer households, in geographically challenging areas (ie, mountainous areas and small islands that are more difficult to reach), and whose mothers are less educated. Indonesia is among the top ten countries with the highest number of unimmunised children.[2] It is reported that in the ten poorest provinces, around 54% of children are still not fully immunised.[3] Though inequalities based on wealth have narrowed, coverage is still over 60% higher among children from wealthier households compared with those living in poorer households. Mother's education also affects the likelihood of a child being immunised; children born to mothers with secondary education are more than 2.5 times more likely to be immunised than those with no education. There are also major geographic disparities, with coverage below 50% in four of the more remote and geographically challenging regions – West Sulawesi, Banten, Maluku and Papua.[4]

Save the Children carried out a study of the barriers to children accessing immunisation in Indonesia, including research in Bandung district in West Java[5] (Pameungpeuk and Majalaya sub-districts) and Sumba Barat district in East Nusa Tenggara[6] (Matala and Puuweri sub-districts). It revealed **multiple drivers of exclusion**, including **policy implementation**, **the impact of decentralisation**, **weak supply chains**, **service delivery barriers** and **parental knowledge and behaviours**. Each of these is discussed in more detail below.

POLICY LANDSCAPE

The Universal Health Coverage policy (introduced in 2014) states that immunisation is free for all children. In an attempt to reach remote and marginalised communities, the government has launched a series of initiatives, including: channelling funds for operational expenses directly from central government to individual health centres; providing funding for disadvantaged areas, borders and the outermost island communities; and implementing the Sustained Outreached Service (SOS) Strategy. While many promising policies are in place at national level, there needs to be greater effort to improve implementation across all districts, ensuring that they are grounded in evidence and lessons learned from local implementation in other areas. Given the variations in coverage across districts, more could be done to share the experiences and approach of better-performing districts with districts that are doing less well.

continued overleaf

Spotlight on Indonesia

continued

IMPACT OF DECENTRALISATION

Immunisation coverage has stagnated following decentralisation, which began in 2001. It has resulted in considerable power and resources being transferred to districts[7] while reducing central government capacity.[8] Although the aim was to improve efficiency, quality and equity of healthcare services, decentralisation has not led to improved immunisation outcomes in many districts.

In particular, decentralisation has affected the sustainability of funding for immunisation. There are variations in local government capacity to manage their budget according to local needs, including allocations for immunisation. Many districts spend primarily on salaries, leaving essential health programmes such as immunisation underfunded. While vaccines are procured and distributed by the national government, local governments need to allocate sufficient resources to implement the immunisation programme, including human resources and transportation costs – both to pick up vaccines and for midwives to reach children in remote villages. Not all districts prioritise immunisation; for some, it is high on the agenda, while for others it is only "an additional health programme" – something that is reflected in budget allocations. Moreover, fiscal decentralisation allows local government to raise revenue, with some now charging fees for health services, including immunisation, despite the national UHC policy stating that services are free for all. District-level capacity needs to be strengthened, but sustainability of funding must also be addressed, with additional resources and strong local government commitment.

WEAK SUPPLY CHAINS

Indonesia manufactures its own vaccines through BioFarma, the national vaccine producer and sole vaccine supplier to the Ministry of Health. The Ministry only procures vaccines from foreign manufacturers for special programmes (eg, measles catch-up campaigns). However, there are major challenges in terms of the efficiency of vaccine distribution and logistics systems, which means vaccines are not always getting to the areas where they are needed. Occasional failures in the national supply lead to vaccine stock-outs in districts (this was reported in both of our study districts). Transporting vaccines to more remote areas is also a challenge, which affects coverage – for example, in Sumbar Barat district, vaccines are only collected four times a year rather than monthly, as in other districts.

Due to technical and non-technical problems, lower levels of government do not always comply with standardised Ministry guidelines on cold chain procedures. Difficulties in managing the cold chain in remote areas of the country (due to unreliable electricity and non-functioning generators) and inadequate record-keeping at some primary healthcare (PHC) facilities are particularly problematic. There must be greater efforts to improve supply chains – eg, by conducting cold chain equipment inventories, routine monitoring of temperatures in storage equipment, reviewing supply chains and developing rehabilitation plans, and training health workers – to ensure that vaccines can reach those who need them most.

SERVICE DELIVERY BARRIERS

Health facilities in Indonesia are not in reach of all children and geographic challenges disrupt the reliability of outreach services. Health worker shortages, high staff turnover and overburdened staff contribute to weaknesses in the delivery of immunisation. This was evident in both Sumba Barat and Bandung districts. Mechanisms to improve staff motivation, skills and supervision are also weak. Health staff and government officials are largely motivated by the target system, which gives priority to quantity over quality of services. The quality of health worker supervision must be improved, including more supportive supervision at health facility level.[9]

continued opposite

Spotlight on Indonesia

continued

While direct costs associated with accessing health services were not cited as a barrier, transport and opportunity costs render poorer households and those in rural areas unable to access services. This was an issue in Sumba Barat and in some parts of Bandung. Missed opportunities are also an issue, occurring at both PHC and village midwife level. Immunisation programmes should be better coordinated and integrated with other maternal and child health programmes to strengthen overall delivery.

PARENTAL BEHAVIOUR AND KNOWLEDGE

Inadequate information and weakness of health messages delivered to parents emerged as an issue. Although parents know and follow the immunisation programme, they do not always know why their children are being immunised, against which disease, and what the benefits of immunisation are. Some parents refused to have their children immunised because they worried they would fall sick, or because of religious beliefs, though the state Islamic Council has recently formally supported immunisation.

Faced with pressure to increase coverage rates, health workers do not always have the time to ensure that people understand the value of immunisation. The fact that healthcare promotion is a separate unit from the Expanded Programme on Immunization, and that there is insufficient coordination between the two, contributes to the problem. As a result, immunisation is sometimes accepted passively and because compliance is demanded by those in a position of power.

Source: Save the Children, Review of the immunisation programme in Indonesia: A study in two districts[10]

STRENGTHENING IMMUNISATION AS PART OF UHC

Essential health services, including immunisation, should be available to all, including the poorest and most marginalised individuals and communities. This must be reflected in strategies and actions at all levels in a country, including in immunisation policies and plans, which should prioritise excluded groups. These groups must be visible at all levels of policy and planning, with strong political commitment, allocated resources and accountability to ensure that the services they are entitled to are provided. This is also vital for implementing strategies and approaches that prioritise reaching every last child, such as the "reaching every district" and "reaching every community" approaches.[11]

Immunisation can show the value of a UHC approach, but will require programmes to truly incorporate UHC ideals into the way they provide services, especially around prioritisation and putting the poorest and most excluded people first.

STRENGTHENING HEALTH SYSTEMS

While delivering services equitably will require sufficient funding (see section 3.2), it also needs investment to build stronger health systems. Strong systems are critical to ensure that services are available, accessible, acceptable, and of good quality.

However, weak and poorly equipped health systems mean that many children cannot access services. Vaccines are useless without a trained, equipped, paid, supported and motivated health worker – in reach of every child – to administer them (Box 5). Yet there is a shortage of about 17.4 million health workers globally,[12] based on the latest minimum threshold of 4.45 skilled health workers for every 1,000 people to deliver UHC.[13] Current trends indicate that shortages will still exceed 14 million in 2030. In Africa, the shortfall is projected to worsen over this period. However, it is not just an issue of the number of health workers but also their distribution, accessibility, acceptability, quality and performance.[14] Governments must meet these critical thresholds and make progress towards

halving inequalities in access to a health worker, as outlined in the new Global Strategy on Human Resources for Health.[15] The multiplier effects must be recognised, as the very same health worker can deliver other preventive services.

Strengthening routine immunisation[16] must be an integral part of wider efforts to strengthen health systems towards delivering UHC. This is also a critical component and guiding principle of the GVAP.[17] This is important for achieving and sustaining immunisation goals[18] and can help increase coverage and equitable access to other essential health services across the continuum of care.[19] Even in conflict situations, immunisation can help improve access to other needed health services – for example, health workers delivering immunisation in conflict areas in Iraq, Syria and Yemen also offer other health and nutrition services.[20] Immunisation services should not only be embedded within PHC systems, but used to strengthen those systems. This is a potential model to help move towards UHC.

STRENGTHENING SUPPLY CHAINS

As part of the systems needed to deliver immunisation to every last child, supply chains and cold chains must be strengthened. This is also important to ensure the safety and effectiveness of vaccines. This means building a well-functioning system of people, infrastructure and equipment to get vaccines from manufacturer to child when needed and at the right temperature. However, many countries have very weak supply chains that lead to irregular vaccine supply and shortages, wasted vaccines, unreliable data, delays in introducing new vaccines and, ultimately, lower immunisation coverage (particularly in remote communities).[21]

Inadequate and poorly maintained cold chain equipment (especially in remote areas lacking electricity) is also a critical issue; it can render vaccines ineffective and even lead to adverse effects in a vaccinated child.[22] Approximately a fifth of all immunisation points in Gavi countries have no cold chain equipment at all, while in more than two-fifths

BOX 5: THE IMPACT OF HEALTH EXTENSION WORKERS ON IMMUNISATION IN REMOTE ETHIOPIA

Health extension workers form part of a wider Health Extension Programme in Ethiopia, which was designed to provide a package of 16 essential health services; it aimed to bring services closer to people in the most rural and remote areas (which are home to 80% of the population). The programme provides two extension workers[23] and a community health post for every 5,000 community members – all within 5km of where people live.

Mulu Refera is one of two health extension workers at Bonde Health Post, a rural post about 50km from Addis Ababa. One of the essential and often life-saving interventions she is responsible for is immunisation. This is part of the country's plan to strengthen routine immunisation and reach every last child.

Mulu makes sure that children in the community get vaccinated by regularly visiting local families. As a regular feature in community life, she is able to check on children who have missed immunisation appointments and ensure that every time a child visits a health post, their vaccination history is up to date. Mulu also delivers other critical services within the programme, including nutrition (for example, all children in food insecurity districts are screened for stunting). Mulu is also an educator and helps the community understand the importance of good health and public hygiene, discussing issues like access to clean water and proper waste disposal.

However, the training given to health extension workers and their commitment to their jobs is not enough. There needs to be better infrastructure and transport, greater availability of new vaccines and (most importantly) a working fridge in each facility to maintain the cold chain. Mulu did not have a fridge at her health post. The larger health centre around 5km away has to deliver and return vaccines stored in cold boxes every day.

Source: RESULTS UK

of them, the equipment is problematic. For example, there may be a high risk of freezing or the need for expensive gas/kerosene (the latter emerged as an issue during our recent study in Indonesia).[24] Inadequate training of health workers on cold chain procedures is also an issue.

Investment in supply chain systems has remained stagnant over the past few decades and focused mainly on cold chain equipment.[25] Efforts must address the entire supply chain system and underlying structural problems.[26] Investment must also keep up with growing needs – for example, storage and transport capacity requirements are projected to double between 2010 and 2020. An estimated $280m is needed each year to meet supply chain needs of low-income countries.[27] Without significant improvements, the ability to achieve global immunisation goals will be compromised.[28] Securing these improvements will require political will at national and sub-national levels; support from global stakeholders (eg, the WHO/UNICEF Supply Chain Hub[29] or Gavi Cold Chain Equipment Optimisation Platform[30]); and investment from both sets of actors to ensure that supply chains are fit for purpose and capable of ensuring that vaccines get to every last child, even in the most remote areas.

FAIR FINANCING FOR HEALTH AND IMMUNISATION

The MDGs led to a surge in development assistance for health,[31] which has certainly helped many countries improve health outcomes. However, it is important to remember that domestic investment has played the more critical role in this progress – and provides 75% of total health expenditure in the average low-income country.[32] As we move into the SDG era there is growing recognition that this critical domestic investment will be what makes the difference in achieving universal services that leave no one behind. National governments have primary responsibility for their own economic and social development.[33]

While aid will continue to be important for some countries in the years to come, the balance needs to shift towards a more domestically resourced, sustainable and locally driven process. As expressed at the 2015 International Conference on Financing for Development, held in Ethiopia, this will require increased national capacity to raise and spend funds domestically through more efficient national tax systems, as well as action at the global level to address tax dodging and illicit financial flows.[34]

DOMESTIC FINANCING

Increased and equitable public investment in immunisation and health systems is needed to ensure the sustainability of immunisation programmes and to make sure that routine immunisation and other essential health services are in reach of every last child. Investment is vital, both for the purchase of vaccines and to strengthen health systems (including cold chains) to deliver vaccines and immunisation services. This is also a goal that countries have committed to under the GVAP.[35] Realising this goal will depend on governments understanding how to sustainably increase their investment in immunisation and health systems (Box 6), and having the fiscal space[36] to allocate additional resources.[37]

In many resource-poor settings, government spending on routine immunisation is low. While public spending on immunisation has increased on average, costs are rising at a faster pace.[38] Government spending on routine immunisation (immunisation-specific expenditure) increased from $21.40 per live birth in 2010 to $26.90 per live birth in 2014. The vast majority of this was spent on vaccines (86% and 88% respectively).[39] In low-income countries, spending more than doubled from $3 to $7 per live birth over the same period, yet levels remain far too low.[40] This is compared with the current cost for the full package of vaccines for a child in a Gavi-eligible country, now estimated at around $32.[41] When factoring in the cost of delivering services, a further $32.6 is needed per child.[42] While some progress has been made, the deficit is far too great to allow complacency.

Many countries rely on external support to deliver immunisation services. Increased spending in most African countries has been largely due to donor funds;[43] fewer than 20 African countries fund more than 50% of their own immunisation costs.[44] A recent study has shown that all 16 countries set to transition from Gavi support by 2018 showed weaknesses in budgeting for vaccine purchases.[45] Many countries' decisions on whether or not to introduce new vaccines are based on the availability of donor funding.[46] This can risk incentivising new

BOX 6: IMMUNIZATION FINANCING TOOLKIT

International support through Gavi and other initiatives has enabled many countries to expand their immunisation programmes, helping the poorest countries to defray costs. But countries need to plan to assume responsibility for immunisation financing after this external support ends. At the same time, many countries have committed to achieving Universal Health Coverage, which also presents a significant financing challenge. This highlights the importance of understanding immunisation financing in the context of broader health financing goals.

Sustainable domestic financing is needed to help countries achieve their immunisation objectives. The Results for Development Institute (R4D) is updating the Immunization Financing Toolkit (previously published by the World Bank in 2010) – a tool to help policy-makers and programme managers understand the options for immunisation financing. The revised toolkit will include an expanded view of the budgeting and planning process for health, analysis of how immunisation fits into the broader health financing agenda, and in-depth examination of potential domestic and external sources of funding. It will also draw on more robust data on immunisation costs from EPIC (EPI Costing and Financing Studies).[47] The toolkit is intended for Gavi-eligible countries, countries transitioning out of Gavi support, and middle-income countries that have never been Gavi-eligible, and is meant to be accessible to a broad range of stakeholders.

Source: Results for Development Institute (R4D)

vaccine introductions without full consideration of the long-term implications on sustainability, and at the expense of directing resources to equitably increase coverage of vaccines already in national schedules. In part, this has been linked to the lower prices that Gavi has been able to achieve due to bulk procurement. But more importantly, in some cases, external support has inadvertently reduced countries' own investment in immunisation as a proportion of total immunisation funding.[48]

Some countries are making good progress in increasing their domestic financing for immunisation. For example, in Ghana, Moldova and Zambia, domestic resources now comprise more than 75% of funding for routine immunisation.[49] Several low- and middle-income countries (for example, Cameroon, Congo, Nepal, Nigeria, Senegal and Uganda) are undertaking new funding mechanisms to improve immunisation financing, supported by legislation.[50]

In addition to increased funding for immunisation and health, countries must improve budget processes, capacity and coordination across relevant ministries.[51] This includes not just timely disbursement of funds, but also ensuring that they are appropriately spent. As shown in the Nigeria spotlight (below), many budgetary allocations return unspent at the end of financing years.

However, it is important that immunisation financing is not analysed alone. It is not simply a question of increasing the share of national budgets allocated to immunisation (and therefore reducing spending on other health services); rather, it requires increasing the size of the health budget. Only nine countries in Africa, to date, have reached the 15% Abuja target for government spending on health. And a mere 16 out of 75 Countdown countries[52] spend the minimum $86 per person per year of public funds required to deliver a basic package of health services. Nearly half spent less than $20 per person in 2013.[53]

Countries' capacity to generate general revenue through tax systems plays a critical role – this is dependent on economic growth, but is also a function of the capacity to collect taxes. By reforming their tax systems and improving compliance, many countries could (and should) collect much more domestic revenue. Experts recommend a minimum intake of 20% of GDP in taxes; however, only 13% of low-income countries currently achieve this.[54]

Spotlight on Nigeria: Increased financing to reach children left behind

INEQUALITIES IN COVERAGE ACROSS STATES

Only about half of all Nigerian children have received basic immunisation.[55] Performance is even worse when looking at full immunisation coverage – only a quarter of children. Disaggregating coverage data across states reveals an even more worrying picture of huge inequalities. With the exception of Ogun state in the south, it is children in the north of the country that are most likely to be left behind in basic immunisation coverage. In Borno, Yobe and Gombe states, far too many children have received no immunisations at all – 70%, 65% and 52% respectively.[56]

The national dropout rate between the first and third doses of DTP/Penta is also high (22%). In Sokoto, Jigawa and Zamfara, dropout rates are 83%, 79% and 60% respectively. Only eight states (Ekiti, Osun, Lagos, Edo, Oyo, Cross River, Imo, and Ebonyi) and the Federal Capital Territory (FCT) had dropout rates below the acceptable level of 10%.[57] This reflects weaknesses of the health system in failing to ensure the regular contact with children that is needed to deliver required services.[58]

THE IMPORTANCE OF SUFFICIENT AND SUSTAINABLE FINANCING

Many reasons have been given for Nigeria's poor immunisation performance, but funding has been a major challenge to the delivery of routine immunisation services.[59] Solid financing is one of several elements required to ensure continuity in services and to fund continuous increases in coverage, as well as quality of and access to traditional and modern vaccines.[60]

All three tiers of government in Nigeria – federal, state and local government areas (LGAs) – have shared responsibility for funding routine immunisation activities.[61] While it is the responsibility of the central (federal) government to develop policy for primary healthcare, to procure vaccines and other devices, and to provide immunisation guidelines and technical support, the sub-national governments (state and LGAs) are responsible for vaccine logistics and the actual implementation of immunisation programmes.[62]

GROWING NEEDS, SHRINKING RESOURCES

The Nigerian economy was recently rebased, leading to a 73% increase in GDP per capita in 2015 (currently $2,690), and putting the country into middle-income status.[63] Nigeria is now above the threshold for Gavi support and should be set to transition from 2017.

This is against a backdrop of increasing resource needs for routine immunisation in the country, with a compound annual growth rate of 95% between 2011 and 2014.[64] It is estimated that immunisation funding needs will reach $280m by 2020.[65] This projected increase will put an additional burden on national, state, and LGA financial structures, at a time when they are already experiencing decreasing support from donors, many of whom are phasing out their health funding, and when polio funding is due to come to an end in the next few years. This is further compounded by a range of other factors, including: weaknesses in institutional capacity; lack of familiarity with national procurement rules; poor planning, budgeting and disbursement processes; and weak national and state regulatory authorities.

continued overleaf

Spotlight on Nigeria

continued

ASSESSING COMMITMENT TO IMMUNISATION FINANCING IN THREE STATES

Funding for routine immunisation is a major issue across all levels of government. While there are federal and state budget line items for routine immunisation, and the federal government appears to be meeting most of its financial obligations, the release of funds is neither guaranteed nor timely. This is also the case with the release of funds from state level to local government health departments and primary healthcare centres, where provisions are made but funding disbursements are not. Even when funds are adequate and released in good time, there is still gross underspending.

A recent Save the Children study to assess the level of commitment to immunisation financing in three states – Jigawa, Zamfara and Gombe – found that there is a huge gap in funding.[66] All three states had expenditure shortfalls, failing to meet the expenditure required for the implementation of routine immunisation.[67] Most of the funds committed were for transportation of vaccine commodities from cold stores to health facilities, while critical activities for the delivery of services were not funded. These activities included (for example) training of health workers, planned maintenance (including expansion of the current solar-powered cold chain equipment) and supportive supervision. Also, actual expenditure for routine immunisation fell far short of projections – only about 11% in all three states.

Pooled funds from state and local governments have recently been used to support vaccine logistics in some states, with some success. For example, resources from the creation of a basket fund in Zamfara state in 2009 have been used to facilitate immunisation programme financing at all levels, including crucial recurrent PHC activities. The fund has contributed to an increase in routine immunisation coverage, a reduction in wild polio cases, better monthly supervision and improved data collection.[68]

LOOKING FORWARD

Immunisation services can only improve children's health if they are adequately and reliably funded.[69] Sufficient and sustainable funding is vital to ensure that services reach every last child. There are a number of initiatives to address the financing situation, including the establishment of a National Immunization Financing Task Team (NIFT). NIFT had proposed a Nigeria Immunization Trust Fund to bridge the gap in vaccine value chain financing beyond 2016. However, this is still at the stage of concept development.

Efforts are also being made to bring in advocates from all backgrounds (eg, influential women, wives of governors, etc) to advocate for increased financing through implementation of the National Health Act. The present government at national level is poised to bring about this change. All relevant stakeholders, especially state and local governments, must step up to the challenge too. The various levels of government must restructure and refocus spending on the social sector in general and children in particular; decision-makers should take into account Nigeria's geographical and demographic complexities, population size, and excluded areas and groups. Targeted approaches are also needed to bridge the gap between states where children are left behind and those where children are faring much better.

Civil society and advocates should draw attention to the need for better financing of routine immunisation at the state level; linked to this, citizens need to be better informed about gaps in funding. The media has an important role to play in disseminating information on expenditure gaps in order to build pressure for change in routine immunisation financing trends.

Source: Save the Children, Nigeria routine immunization financing study[70]

Spotlight on Ethiopia: Immunisation financing to reach all regions

Ethiopia has made tremendous progress in reducing under-five mortality – from 145 deaths per 1,000 live births to 62 per 1,000 live births between 2000 and 2014[71] – thereby reaching its MDG 4 target. Increasing coverage of health services, notably immunisation, has contributed to this progress. But despite this progress at national level, remote and deprived regions of the country continue to be left behind. Much more must be done to reach children in these areas.

CHILDREN LEFT BEHIND

All regions – including emerging regions of Afar, Benishangul-Gumuz, Gambella, and Somali[72] – have made progress in improving immunisation coverage. For example, in Afar, Penta 3 coverage increased around ninefold between 2000 and 2011.[73] However, there remain substantial disparities between regions.[74] Coverage is around nine times higher in Addis Ababa than in Afar (where it is only 10%).[75] This has improved since 2005 though, when only one child in Afar was immunised for every 30 children in Addis Ababa. Gambela, Oromia and Somali regions also have low coverage, below 30%.

IMPORTANCE OF SUFFICIENT AND SUSTAINABLE RESOURCES

Timely, reliable and complete information on financial resources in the health sector is critical for sound policy-making and planning.[76] Accurate and timely tracking of financial flows is essential for accountability, ensuring public awareness of actual disbursements rather than just expressed commitments. Financial tracking can also help policy-makers reach informed decisions, set priorities, efficiently allocate resources, and ensure sustainable programme funding.[77] In Ethiopia, the system for tracking and evaluating public expenditure and ensuring accountability has several weaknesses, many of which are due to fiscal decentralisation, limited capacity for expenditure reporting, aid management complexities, capacity constraints, weak documentation and attrition.[78]

Save the Children carried out an analysis to capture the data on sources of health funding in Ethiopia between 2000 and 2013/2014 to identify trends, focusing on allocations to routine immunisation. This included vaccines in general vis-à-vis the government's commitment towards universal coverage of routine immunisation.

BUDGET ALLOCATIONS FOR HEALTH

The health budget is approximately 5.6% of the Ethiopian government's total budget.[79] While budgetary allocations (including donor funding) to the health sector have steadily increased over the past two years, the share of the total budget allocated to health has remained constant. The sector has commanded an increasing share of the regions' total budget, suggesting that with implementation of the Health Sector Development Programme (HSDP), health has been prioritised. However, health allocations in every region have remained below HSDP projections, with non-salary recurrent expenditures suffering.

FINANCING FOR IMMUNISATION

The majority of financing for reproductive, maternal, newborn and child health (RMNCH) services, including immunisation, comes from official development assistance (ODA) and government sources. Additional sources include loans, private employers, NGOs and parastatals.

Immunisation expenditure accounts for around 43% of child health expenditure (around 6% of the total health budget). There is no consistent trend but, overall, expenditure on immunisation has increased over the past decade – by around

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Spotlight on Ethiopia

continued

20 times – alongside increases in the general health budget. Total expenditure on immunisation in Ethiopia in 2014 was $109,287,287, with expenditure for the procurement of vaccines and other supplies comprising nearly 80% of this.[80] Investments in health system strengthening comprised nearly 17% of expenditure. A large portion of costs over the years has been invested in upgrading immunisation structures in order to be able to reach more children.

Domestic resources accounted for over 30% of the total immunisation budget in 2015 (an increase from less than 15% in 2010) and 12% of the portion used to purchase vaccines.[81] Government spending has increased over the years, while allocations from development partners have decreased. While allocations vary across regions,[82] per capita allocations are generally low. The lowest allocations are in emerging regions. Budget utilisation is slowly improving in emerging regions, though not as much as in agrarian regions (Tigray, the Southern Nations, Nationalities, and Peoples' Region (SNNPR), Oromia and Amhara). The lower expenditure in emerging regions may be attributable to weak health systems and difficulty in expanding immunisation.

MOVING FORWARD

While there have been significant improvements in coverage of essential health services, including immunisation, more needs to be done to ensure that services reach every last child in Ethiopia, particularly in regions where coverage is poor. The government needs to mobilise more funding and improve allocations for health and immunisation to help strengthen the health system. This is the best way to equitably deliver services and close the gap in coverage between regions and between rural and urban areas. Emerging regions need additional support to improve planning and timely utilisation of budgets, to enable them to improve delivery and coverage. Save the Children can support government efforts to deliver immunisation services, ensuring that they can reach more remote areas and marginalised communities.

Source: Save the Children, Budget tracking: Allocation and utilization of RMNCH budget in Ethiopia[83]

MULTILATERAL AND DONOR FUNDING

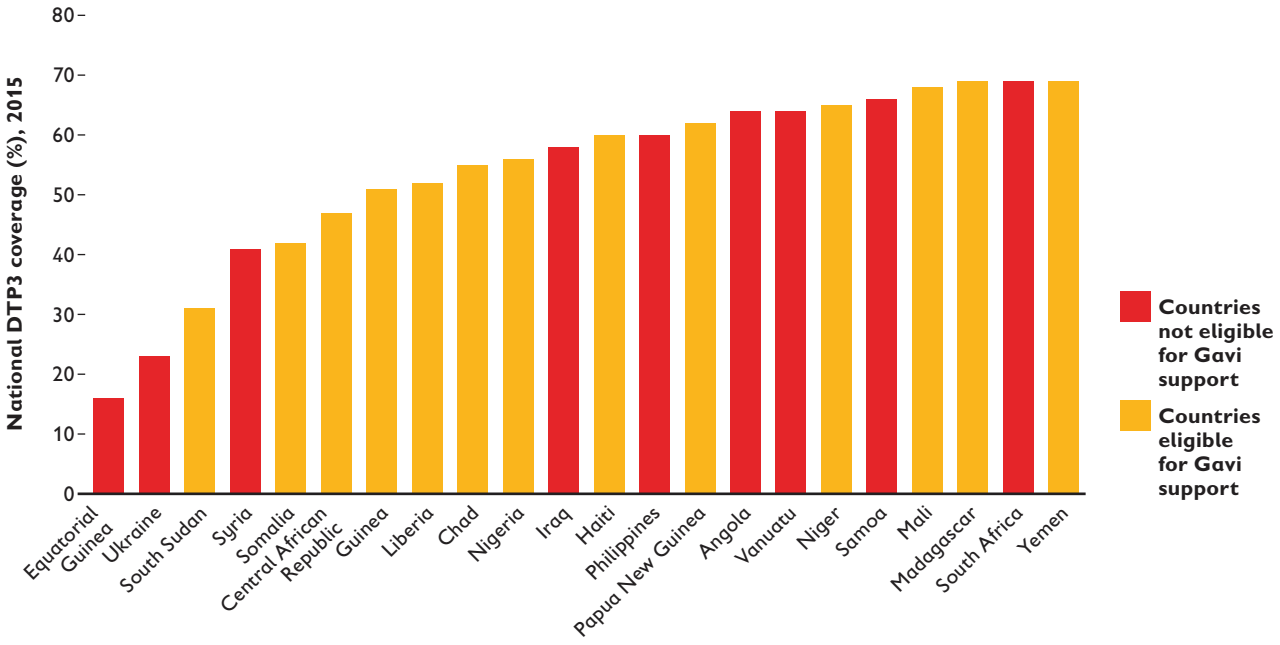
Multilateral and donor support has helped to reduce the immunisation funding and coverage gap between countries. In countries eligible for Gavi support, DTP3 coverage reached over 80% last year, with an additional 207 million children being immunised since 2010, averting around 3.1 million deaths.[84]

While greater domestic responsibility and resources are key to expanding and sustaining coverage in the future, development aid will continue to play a role for the time being. Global financing must be fit for purpose to support countries to reach every last child with immunisation, including responding to the changing nature of poverty and rising inequalities in middle-income countries. Eligibility for aid, including from Gavi, is often determined by a country's gross national income (GNI). This is largely driven by a desire for a simple indicator, despite the weakness of GNI as a measure.[85] Gavi, for example, sets its threshold at GNI per capita of $1,580.[86]

This means that many middle-income countries, and particularly lower-middle-income countries, do not qualify for support. This is despite the fact that many of these countries have only recently attained middle-income status, taking "a lot of poor people with them into that status".[87] Globally, over 70% of those living in extreme poverty are in middle-income countries, mainly in lower-middle-income countries.[88] A number of countries are set to transition from Gavi support due to increases in GNI, while others have never been eligible; yet many of them face challenges of low immunisation coverage and high inequities (Figure 12 and Figure 13). Some countries face the additional burdens of ongoing conflict and other emergencies, with high numbers of internally displaced persons or refugees.

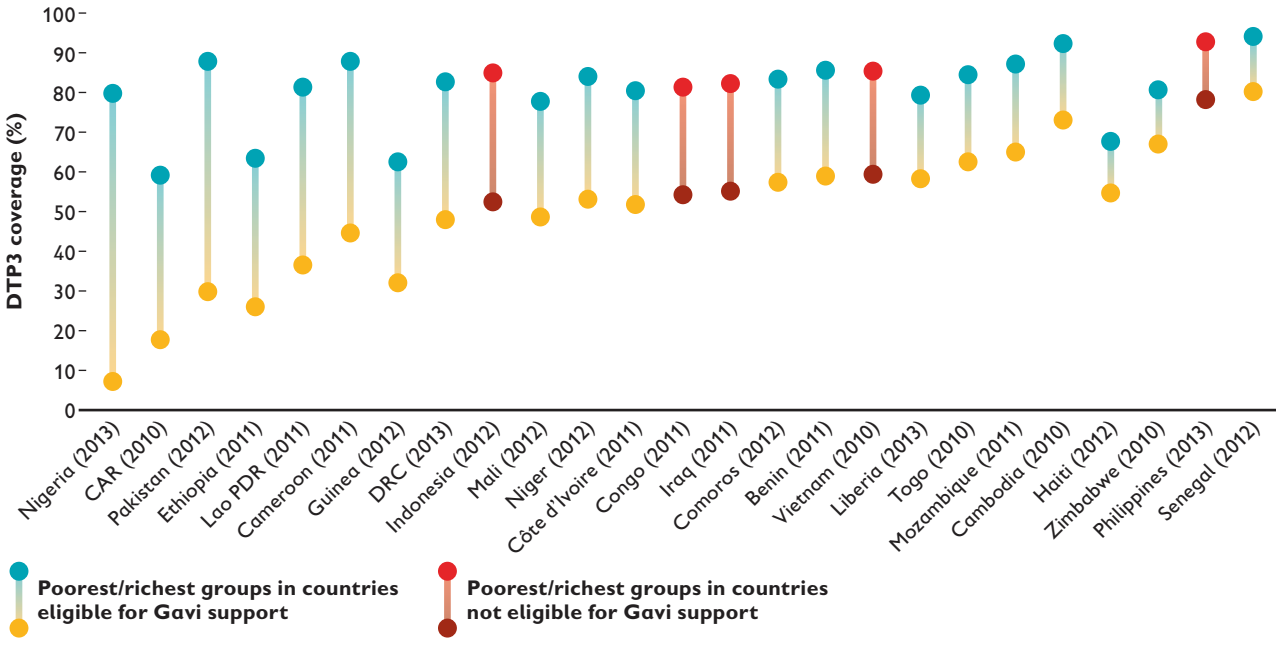
The current focus on only the poorest countries means that many of the poorest children are missing out. Other factors should also be considered – such as a country's fiscal space – when assessing if countries are spending what they should or could on health.[89] If this assessment is conducted as part of a transparent and inclusive process, it could also strengthen civil society advocacy for domestic health financing.

FIGURE 12: COUNTRIES WITH DTP3 COVERAGE NOT EXCEEDING 70%, GAVI vs NON-GAVI ELIGIBLE



Source: based on an analysis of WUENIC data

FIGURE 13: COUNTRIES WITH HIGHEST INEQUALITIES IN COVERAGE BASED ON WEALTH, GAVI vs NON-GAVI ELIGIBLE



Source: based on an analysis of DHS and MICS surveys since 2010

DONOR PRIORITIES FOR NATIONAL HEALTH SYSTEMS?

The other part of the picture is how donor money is spent. Over the past 15 years, external assistance has largely been driven by the MDGs and donor priorities. While it has led to significant funding for immunisation (as discussed previously), much of this has been for the purchase of vaccines or the eradication of specific diseases. For example, the vast majority of Gavi support is to purchase new vaccines, with very little funding directed towards strengthening health systems and service delivery.[90] Less than 5% of the budget for the 2012 immunisation plan of action for the Africa Regional Office of the World Health Organization (WHO/AFRO) was for strengthening of routine immunisation systems.[91] Meanwhile, 85% of its immunisation budget goes towards polio eradication.[92]

Global funding must play a greater role in supporting countries to strengthen health systems to deliver UHC, rather than just disease-specific and vertical interventions (Box 7). This is vital to support the delivery of immunisation and to sustain equitable progress. As Seth Berkley, Chief Executive Officer at Gavi, The Vaccine Alliance, stated early in 2016: "The power of routine immunization is that it already reaches millions through established structures in places where few others exist. As programs expand to protect more children, they can help form the backbone of Universal Health Coverage (UHC). As the Ebola outbreak has shown, the value of these core health system functions should not be underestimated."[93]

There has been an important shift in Gavi's new 2016–2020 strategy,[94] with an increasing focus on equity and health systems (Box 8). This is a welcome change and must now be delivered on over the next five years, measured by health system impacts, not just immunisation outcomes.[95] Gavi must allocate sufficient resources to strengthen health systems to deliver this strategy.[96] The resources, infrastructure, workforce and systems in place to reach every last child with the polio vaccine must also be used to strengthen routine immunisation and health systems.[97] These resources must not be lost when the Global Polio Eradication Initiative (GPEI) comes

BOX 7: THE RISK OF VERTICAL APPROACHES TO HEALTH SYSTEM STRENGTHENING

Country support through global funding mechanisms has increased during the past two decades. While these mechanisms bring much-needed funds and technical innovation, they also have a number of unintended consequences. Their disease-specific orientation can risk shifting government priorities away from coordinated efforts to strengthen health systems through their focus on vertical priorities. This can lead to a 're-verticalisation' of systems. Debates around this have led to organisations increasingly considering how they contribute to the health systems agenda.

Since 2005, Gavi has expanded its focus on vaccines to include support for health system strengthening, with the view that vertical investment can achieve 'horizontal' aims such as this. However, Gavi's approach to health system strengthening has shifted from its original conception of flexible country support, to only strengthening the components needed to achieve vaccination goals. Presented as being cost-effective and "saving lives", this approach is politically appealing to donors and difficult to challenge. As a result, support for health system strengthening often now follows a disease-specific approach.

However, recent ethnographic research shows that this approach may not be fully aligned with earlier, broader interpretations of health systems. While it can lead to targeted technical solutions with clear, measurable outcomes, it does not address wider economic, social and political contexts. Incorporating health system strengthening within the remit of disease-specific global health initiatives risks legitimising some of the very practices that have arguably contributed to weakening health systems in resource-poor countries.

Source: Based on K Storent, 2014[98]

BOX 8: ADDRESSING INEQUALITIES THROUGH GAVI'S 2016–2020 STRATEGY

Through its new 2016–2020 strategy, Gavi will "intensify its efforts to ensure that as many children as possible are fully immunised by supporting targeted approaches to increase overall coverage and improve equity among marginalised and traditionally under-immunised populations".

This will be delivered through four strategic goals:

1. **The vaccine goal**: accelerate equitable uptake and coverage of vaccines.
2. **The systems goal**: increase effectiveness and efficiency of immunisation delivery as an integrated part of strengthened health systems.
3. **The sustainability goal**: improve sustainability of national immunisation programmes.
4. **The market-shaping goal**: shape markets for vaccines and other immunisation products.

Gavi and Alliance Partners will re-focus their efforts by intensifying engagement in 20 priority countries with tailored support, prioritising in-country needs and matching this with appropriate resources.[99]

Source: Gavi, the Vaccine Alliance

to an end. The importance of polio systems has already been seen with the containment of Ebola in Nigeria.[100] With an increasing focus on domestic resource mobilisation,[101] the global community and donors should also support countries to increase domestic fiscal space for health and immunisation.

ACCOUNTABILITY TO CHILDREN

There must be greater accountability to children, their families and communities. Every last child must be able to access and utilise immunisation and other essential health services without facing any exclusionary barriers. Key actors at all levels – decision-makers, service providers, and the private sector – must be held accountable for providing these services to which all are entitled, and for creating an enabling environment for this to be possible.

UNCOUNTED CHILDREN – THE NEED FOR BETTER EVIDENCE AND DATA

Unfortunately, we do not have a full picture of which children are missing out on immunisations, because many children are simply not counted within the data. The absence of good-quality, timely and regularly available disaggregated data is a critical challenge to identifying and addressing the needs of the most excluded children. Certain groups of children may be left out of official statistics due to financial constraints, political decisions or for situational reasons (Box 9). In 2015, 82 out of 194 countries that have committed to the GVAP did not produce immunisation data by district or produced district data that were not considered valid by WHO-UNICEF.[102] Only 51 countries have carried out a national Demographic and Health Survey (DHS) or Multiple Indicator Cluster Survey (MICS), since 2010, to collect data on immunisation coverage according to household wealth; only 25 countries have collected this data according to ethnicity. Very few countries collect immunisation data that is disaggregated by race, ethnicity, religion and disability.[103] There are also evidence gaps on interventions to improve immunisation coverage among these vulnerable groups.[104] If we do not know who or where these children are, programmes and services cannot be properly designed to ensure the inclusion of every last child.

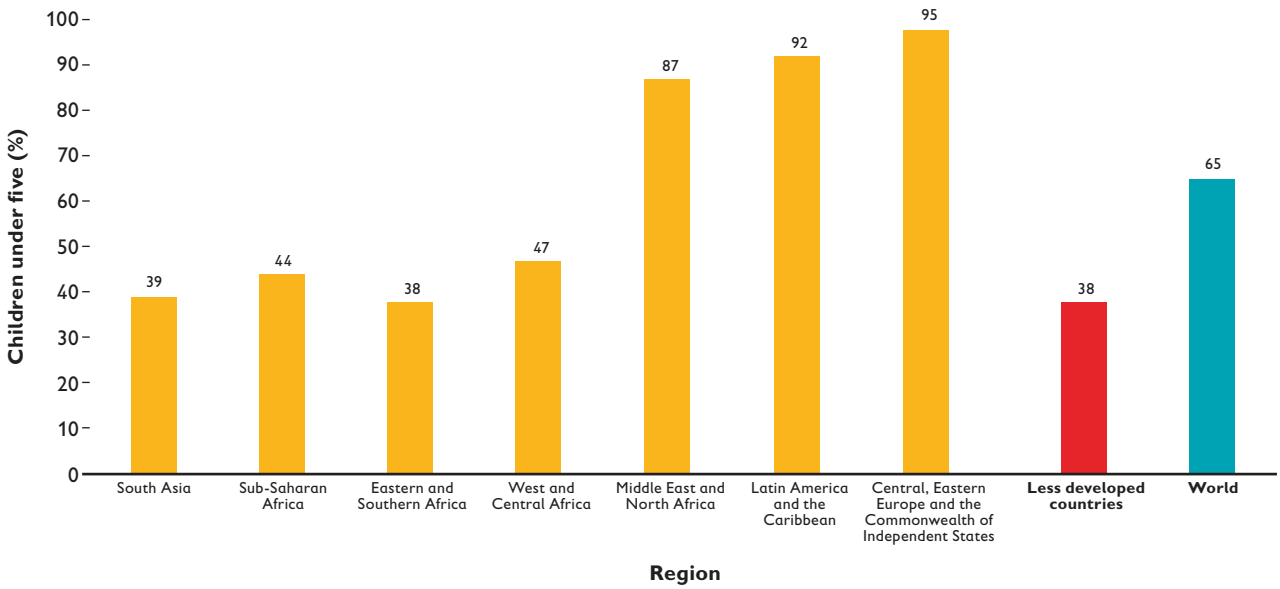
The issue of poor-quality or unavailable disaggregated data on immunisation coverage is compounded by the fact that millions of children are not even accounted for in the first place. Globally, 230 million children (one in five) under the age of five were not registered at birth. This issue is most critical in sub-Saharan Africa and South Asia, where only 44% and 39% of births, respectively, are registered (Figure 14).[105] Hence, we do not have an accurate denominator to really know how many children are not being immunised. Children who are less likely to be registered at birth are typically from certain ethnic or religious groups, living in rural and remote areas, from poorer households, and born to mothers with little or no education.[106]

BOX 9: WHY DO CERTAIN CHILDREN GO UNCOUNTED?

- **Financial constraints**: To identify all relevant groups in a country, a survey must cover a large sample of the population. Large household surveys can be costly, and some areas of a country go underrepresented, leaving certain groups of children uncounted in the data. This is often the case for children living in informal urban settlements and those living in remote regions where it can prove more difficult to identify and access households to be surveyed. If these children are to be counted, resources are needed to fund national survey systems and to invest in new technologies to make statistical systems more efficient.
- **Political decisions**: Collecting certain forms of data may be highly politicised. This is often linked to the legal status of a particular group (such as refugees or stateless children), or is based on concerns that identifying these groups and awareness of their disparities could lead to unrest. A number of countries (including Argentina, France and South Sudan) do not collect information on race or ethnicity in official statistics, while in others, the categories used are vague (as in India). While the identification of marginalised groups in official statistics may prove challenging or, in extreme cases, even dangerous, technical expertise could be shared by those countries that successfully monitor marginalised groups in complex political settings.
- **Situational reasons**: Some groups of children are difficult to survey simply because they are hard to find. This is the case for children with disabilities, who may be hidden within their household or institutions, children on the move who do not register with authorities, and street children with no fixed address. Special measures are needed to survey the needs of these children; it may be that separate data collection efforts are needed outside of national censuses in order to identify and count these children.
- **Poor oversight of reporting**: Even where data collection and reporting mechanisms are in place, there may be poor oversight of their accuracy and quality. For example, health officials may make up or exaggerate data in order to hit targets, thus distorting the true picture of what is happening on the ground.

Source: Adapted from *Every Last Child: The children the world chooses to forget*[107]

FIGURE 14: PERCENTAGE OF CHILDREN UNDER FIVE WHOSE BIRTHS ARE REGISTERED, BY REGION



Source: UNICEF, Every child's birth right: Inequities and trends in birth registration, UNICEF, 2013

Countries must step up efforts to make sure that every child is counted. Every child has the right to a name and nationality. In many countries, birth registration is a requirement in order to access immunisation and other health services, and so to fulfil other fundamental rights such as the right to health.[108] With improved data, countries would be better able to identify which children are being left behind, and where they can find children who have not been immunised, including specific vulnerable and excluded groups. Better data would also help countries develop targeted policies and plans to reach every last child. This is also vital in order to track progress,[109] so that governments can be held accountable.

EMPOWERING COMMUNITIES

Communities – including excluded groups and children themselves – and CSOs must be empowered to demand their rights and to meaningfully engage in policy-making, designing and implementing strategies and budget processes linked to immunisation and health.[110] They are often excluded from discussions and decisions about important matters that affect them. Communities must have a voice in decision-making, as they could play an important role in helping to identify immunisation gaps and solutions. This can foster ownership, promote accountability[111] and lead to higher coverage.[112] Better partnerships between governments and CSOs would help make this happen (Box 10). Communities and CSOs must also be empowered to hold governments accountable on their commitments. Greater efforts are needed to involve communities and others outside of the EPI to measure accountability.

VACCINE AFFORDABILITY AND APPROPRIATENESS

While governments have primary responsibility for ensuring that immunisation and other essential health services reach every last child, it is vital that vaccines and the equipment needed to administer them are affordable and appropriate.

PROHIBITIVE VACCINE PRICES

An increase in the number of recommended vaccines in immunisation programmes means children are protected from more diseases, but it also means that fully immunising a child is much more expensive than it was a decade ago. The full package of vaccines for a child in a Gavi-eligible country now costs around $32, plus delivery costs.[113] This is much higher for countries not eligible to access Gavi prices. The bulk of recent additional costs comes from pneumococcal and rotavirus vaccines.

BOX 10: WORKING IN PARTNERSHIP TO ACHIEVE SUSTAINABLE IMPACT IN BANGLADESH

Pneumonia is one of the leading causes of death globally in children under five.[114] The under-five mortality rate in Bangladesh has almost halved over the past 15 years – from 88 in 2000 to 46 in 2014,[115] with the country exceeding its MDG 4 target. Despite this progress, many children still die from preventable and manageable conditions such as pneumonia, measles and diarrhoea.

Save the Children set up a coalition of civil society actors in Bangladesh to advocate for the provision of the pneumococcal vaccine and the Community Case Management approach. Partners worked together to coordinate advocacy with the government, including the Ministry of Health and Family Welfare, and worked directly with policy-makers through national committees and working groups. They also carried out public mobilisation.

In early 2015, the Bangladesh government announced that it would integrate the pneumococcal vaccine in routine immunisation services, and that the Community Case Management approach would be included in the next national Child Health Strategy. The coalition partners played a catalytic role in ensuring commitments by the government.

Source: Rashti, N. Evaluating the successes and challenges of working in partnership to achieve sustainable impact – pneumonia vaccine and community case management: Bangladesh, Save the Children

Due to limited competition to help drive down prices for these two vaccines,[116] their cost remains high. Lack of vaccine price transparency for non-Gavi eligible countries makes it nearly impossible to determine how much countries are actually paying for new vaccines, but based on reports, they are paying much in excess of Gavi prices.[117]

So while many lives have been saved by these new vaccines, they may be out of reach for many children. For example, rotavirus vaccine coverage is only about 19% globally, and some of the countries that have the highest burden of diarrhoeal diseases are yet to introduce it.[118] The price of the pneumococcal vaccine poses similar challenges for both Gavi-eligible and non-eligible countries. Many middle-income countries have foregone introducing new vaccines due to prohibitive costs.[119] As a result, many of the poorest and most marginalised children – who need these new vaccines the most – are not receiving them.

More needs to be done to ensure that vaccines are affordable for countries, so that immunisation gains can be expanded and sustained. Manufacturers must charge affordable prices to countries, and organisations delivering immunisation services in humanitarian contexts[120] should be able to access vaccines at the lowest global price.[121] Prices and price setting must also be made transparent so that countries can negotiate on a fair playing field.[122] Multilateral and relevant technical agencies, in addition to donors and governments, also have a role to play – for example, in facilitating competition by increasing the base of suppliers, supporting technology transfer to build the capacities of emerging market producers, and encouraging the use of intellectual property flexibilities in cases where this may be a barrier to competition. Pooled procurement is also an important approach to create economies of scale and allow cost-savings from predictability of demand. Options should also be explored to increase development and production of vaccines in emerging economies and encourage and support local production where capacity exists, which will help increase competition to drive down prices. But this rests on technological transfer and dissemination of scientific know-how. There must be concerted effort and open dialogue among all stakeholders to ensure that vaccine prices are not a barrier to reaching every last child.

APPROPRIATE VACCINES AND EQUIPMENT

Appropriate vaccines and presentations (eg, product presentations, doses per container), as well as equipment to transport and store vaccines at the right temperature, are not always developed or adapted to suit the needs of low-income settings. This can be a particular problem in rural and remote areas, where supply chains and cold chains may face numerous challenges; this could lead to wastage and missed opportunities to vaccinate children. This is mainly due to the way research and development (R&D) systems are set up, which do not always respond to the needs of countries where children are being left behind. R&D typically focuses on diseases affecting people in wealthier countries, where there is bigger potential for profit, rather than in poorer countries, where profitability is lower.[123] Although governments already play a large part in R&D for neglected health conditions, efforts are not sufficient to ensure that the right products and presentations are available to promote equitable access in low-income countries. The global community is failing the world's most vulnerable and marginalised people by not protecting their fundamental right to health.[124]

All stakeholders need to do more to ensure that the right vaccines and presentations are developed, and they must make innovative technologies and equipment more widely available, to expand access in remote and neglected areas. Some examples of these technologies include, the Uniject™ injection system,[125] intradermal delivery,[126] vaccine vial monitors,[127] controlled temperature chain labelling[128] and solar refrigerators.[129] Vaccine manufacturers clearly have a frontline role to play. However, given that immunisation is a global public good, there is also a need for increased public investment and incentive models for R&D that work for resource-poor settings and are conducive to reaching every last child.[130] The recent success of the MenAfriVac® vaccine – a low-cost, tailor-made vaccine against meningitis A, developed specifically for sub-Saharan Africa[131] – provides hope that this is possible. The right political will and financial backing is crucial in advancing this agenda.

ADDRESSING HOUSEHOLD- AND COMMUNITY-LEVEL BARRIERS

Reaching every last child with immunisation will require not only the important focus on addressing supply-side issues, but also critical demand-side constraints at household and community levels (for example, gender and knowledge barriers) that may prevent parents bringing their children for immunisation.

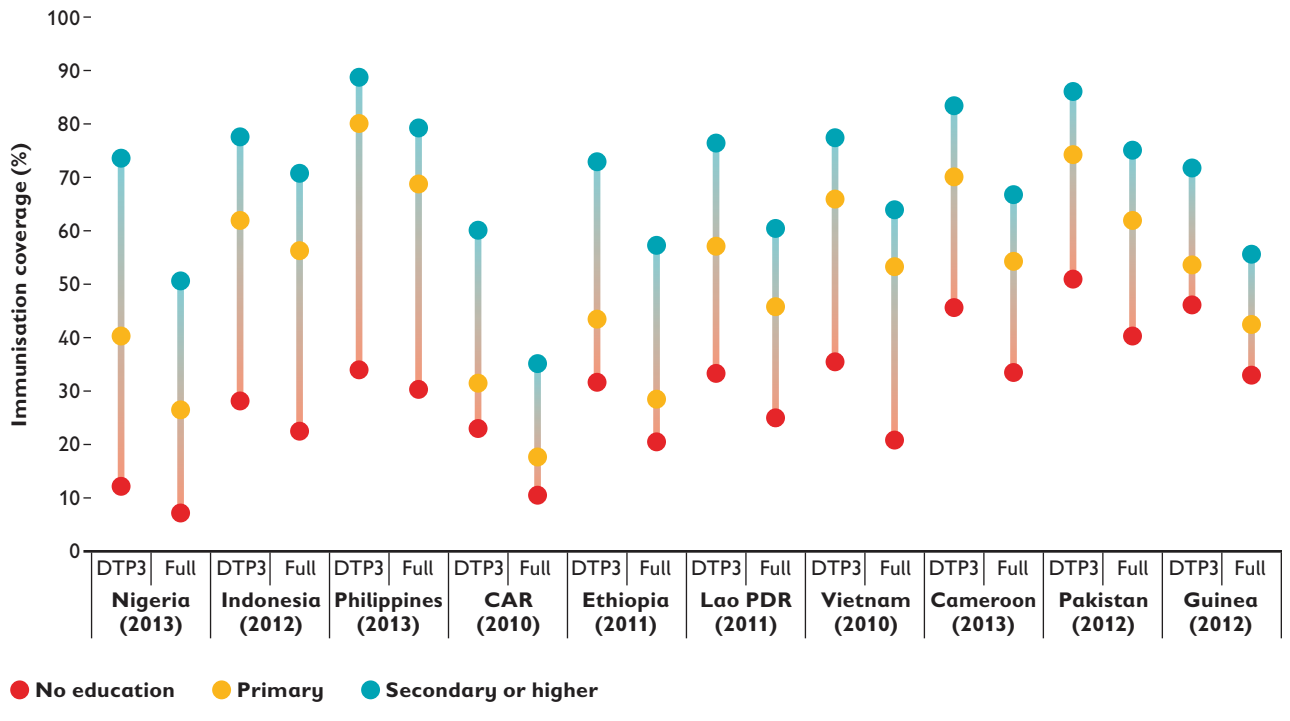
ADDRESSING GENDER BARRIERS

While there are no significant differences in the level of immunisation coverage globally between girls and boys,[132] a number of gender-related issues are driving exclusion, making it less likely that a child of either sex will be immunised. Women are usually responsible for the care and health of children; any gender barriers women face in accessing health services are therefore likely to affect their children.[133] These barriers vary by country and context, but tend to be more pronounced in resource-poor settings.

For example, a woman's education level is strongly linked to the likelihood of her child being immunised.[134] A child whose mother has not completed primary education is less likely to be immunised than a child whose mother has completed primary education. When a mother is educated to secondary level or higher, the likelihood of her child being immunised increases (Figure 15). In Nigeria, a child whose mother is educated to secondary level is more than six times as likely to be immunised as a child whose mother has no formal education – 74% against 12%. Meanwhile, coverage is 40% among children whose mothers have primary education. In Indonesia, the Philippines and Central African Republic, children of mothers with secondary education are more than 2.5 times more likely to be immunised than children of mothers with no education.

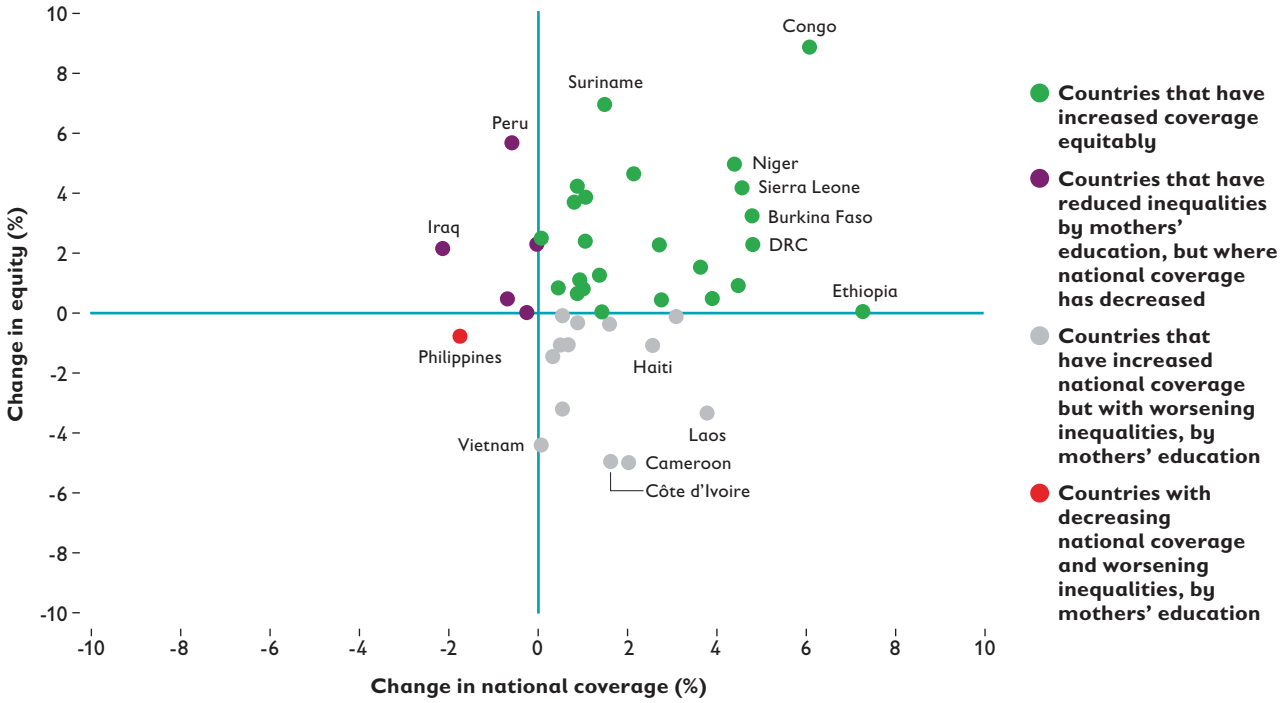
Changes in national coverage and in inequalities based on mothers' education are shown in Figure 16. Among the 42 countries with available data, inequalities are worsening in 14 of them. Cameroon, Côte d'Ivoire and Vietnam have the worst performance. In Côte d'Ivoire, this is alongside declining national coverage. In Cameroon, national coverage has been slowly increasing and it has remained high in Vietnam; hence, children whose mothers have no education are being left further behind. Among the ten countries with the highest

FIGURE 15: TOP TEN COUNTRIES WITH HIGHEST INEQUALITIES BASED ON MOTHERS' EDUCATION



Source: Save the Children analysis of most recent DHS and MICS data (since 2010) for the ten countries with the highest ratios between DTP3 coverage for mothers with secondary education or higher and mothers with no education

FIGURE 16: CHANGE IN NATIONAL COVERAGE OF DTP3 AND EQUITY BASED ON MOTHERS' EDUCATION



Source: Save the Children analysis of DHS and MICS data (since 2010) for countries where a previous survey is available. Graph looks at average annual change in national coverage between 2000 and 2015 (based on WUENIC data) and change in ratios between mothers with secondary or higher education and mothers with no education

inequalities, the coverage gap between mothers with secondary or higher education and mothers with no education is only closing in the Philippines (by over 20% between 2008 and 2013) and in Indonesia (by less than 10% between 2007 and 2012).

There are numerous gender-related barriers to children accessing immunisation – including gender inequality, a woman's lower status in the household, limited decision-making power, limited access to and control over resources, and limited education and access to information.[135] For example, limited decision-making power and control over resources may mean that a mother cannot prioritise spending to get her child to an immunisation point, while limited access to information may mean she does not understand the importance of child immunisation, thus undermining demand. Women also face time constraints due to competing responsibilities (such as household tasks, social responsibilities and income-generating activities). These problems may be exacerbated in female-headed and poorer households, as well as among migrant and marginalised communities, where women may lack a social support system[136] to provide the necessary help (money or childcare) to allow them to take their children to be immunised.[137]

While many gender-specific barriers relate to household dynamics, they may be exacerbated in countries (or areas within a country) where gender discrimination is more prevalent. For example, discrimination, isolation and gender norms can restrict a woman's or girl's movement in public, limiting their ability to access immunisation and health services.[138]

These gender barriers to accessing and utilising immunisation and other health services must be addressed; failure to do so may inadvertently exacerbate gender inequalities,[139] including barriers at the household and community levels, as well as within the wider health system. Research indicates that as women become more empowered,[140] immunisation coverage increases.[141] Gavi, for example, has recently approved a revised gender policy to support countries to address gender-related barriers to accessing immunisation with the aim of increasing coverage.[142]

BETTER INFORMATION AND COMMUNICATION

Where communities know their rights, are aware of the benefits of health services, and know where, when and how to access them – and where they trust the service providers – immunisation coverage is higher.[143] Insufficient, inappropriate and poorly communicated information on immunisation is clearly a barrier to accessing services. For example, research from Indonesia revealed that parents do not always know why their children are being immunised, or the benefits of it.[144] Information may not be communicated in the local language or in languages spoken by minority, marginalised or migrant groups, or may be transmitted in ways that exclude some groups (for example, poorer households may not see public health campaigns on TV, while illiterate families cannot access written materials).[145] Where information is available, it may not be appropriate in terms of social norms, beliefs and values.

The source of information is also important. A number of studies – in Ethiopia, Haiti, India, Kenya and Turkey, for instance – have revealed that people's health-seeking behaviours were more responsive to information from members of their own community rather than from formal sources.[146] This can sometimes have negative implications if influential community voices convey conflicting messages that undermine the importance of immunisation.

Where information and communications are inadequate to promote the benefits of immunisation, or where they are used to fuel negative perceptions and resistance, this can lead to low immunisation coverage and pockets of children that have not been immunised. For example, traditional and local beliefs around illnesses may influence perceptions about the usefulness of immunisation.[147] Studies from Bolivia, India, Nigeria, Turkey and Uganda reveal evidence of people being reluctant to have their children immunised.[148] This may be linked to the vaccines themselves (due to safety concerns or certain religious and ethical beliefs, for example), or it may be due to distrust of health workers, the immunisation programme, or the health system more broadly.[149] There might be suspicion around the motivations for vaccination campaigns.[150] These may be fuelled or worsened by rumours that are either fostered within communities or are politically motivated. The reasons why parents may be reluctant to take their children for immunisations vary from context to context and are continuously changing.[151]

4 Conclusion and recommendations

Governments have committed to achieving universal immunisation coverage through their endorsement of the Global Vaccine Action Plan[1] in 2012 and, more recently, in February 2016, the Ministerial Declaration of African Ministers of Health on Universal Access to Immunisation as a Cornerstone for Health and Development in Africa.[2] With the adoption of the SDGs in 2015, governments have committed to achieving UHC (under SDG 3), promising to "leave no one behind".

However, these immunisation and health targets will not be achieved unless the barriers that prevent excluded groups accessing these services are addressed. This gives further impetus to ensuring that every last child is reached with immunisation services. Prioritising equitable access to immunisation and other essential health services for every last child is a catalyst to achieving global – and national – goals.

While commitments are important, they must now be turned into action. Many of the barriers to immunisation are well known – as are the solutions.[3] There is much more still to do to ensure that excluded children and their communities can access immunisation and health services. The seventh child still missing out on immunisations must be reached. This will maximise the value for money represented by immunisation and, in the long term, will be more cost-effective, by accelerating progress in reducing child mortality and bringing more sustainable development gains.[4]

Reaching every last child must be a political priority, with a renewed focus on the role of governments in attaining this goal. Increased political will must drive action.[5] Strong commitments to routine immunisation have been associated with higher coverage.[6] This includes domesticating global and regional commitments and plans so that they become a national priority and are nationally owned. Political will and domestic investment are crucial to allocate and equitably distribute the resources and human capacity needed to drive lasting change.

RECOMMENDATIONS

We must ensure that every last child – regardless of where they are born, their level of poverty or social exclusion – has access to immunisation as an early priority in building Universal Health Coverage. Every child has the right to immunisation as part of their right to health. It is the responsibility of actors at all levels to ensure that this right is realised, breaking down the barriers that drive exclusion. To do so will require strong political leadership, commitment and domestic investment.

We must act now. At the midpoint of the 2011–2020 Global Vaccine Action Plan – when progress has slowed and is off track – there is an urgent need to do more to strengthen commitments and accelerate action to ensure that every last child is reached with immunisations.

WE CALL ON NATIONAL GOVERNMENTS TO:

- prioritise achieving universal immunisation coverage and reaching every last child
- turn commitments into action to accelerate progress to improve immunisation coverage and equity with explicit, time-bound, fully resourced and measurable plans
- strengthen policies and actions so that they prioritise children left behind, reviewing and revising policies that may inadvertently exclude some children
- strengthen immunisation systems as part of comprehensive primary healthcare, particularly in poor, under-served and excluded areas

- increase public investment in immunisation as part of growing health budgets, ensuring equitable allocation of resources to neglected regions
- ensure thorough and advanced planning for transitioning from Gavi and donor support, while raising sufficient and sustainable domestic financing to sustain immunisation programmes
- improve data collection, including disaggregated data, to identify which children are being excluded and to inform strategies to reach them
- as part of the polio transition process, ensure that polio resources and infrastructure are used to strengthen national routine immunisation and health systems
- empower and engage communities and civil society organisations to engage in immunisation planning, delivery, monitoring and accountability mechanisms
- report vaccine prices paid as part of transparency efforts.

WE CALL ON DEVELOPMENT PARTNERS TO:

- support countries to strengthen immunisation systems alongside the wider health system
- following transition from polio support, help transfer polio lessons, funding and other resources to strengthen national routine immunisation and health systems
- support countries to increase their domestic fiscal space for health and immunisation
- ensure strong civil society representation in monitoring and accountability processes
- champion the opportunity provided by immunisation to promote equity across primary healthcare, encouraging investment from governments and donors
- play a stronger role in shaping vaccine markets so that prices are affordable in the long term for governments in Gavi transitioning and middle-income countries.

WE CALL ON THE PRIVATE SECTOR TO:

- make vaccines affordable for Gavi-eligible as well as middle-income countries
- charge the lowest global vaccine prices to organisations delivering immunisation services in humanitarian contexts
- increase the transparency of vaccine prices and pricing mechanisms, not just for Gavi-procured vaccines but for all vaccines, from all manufacturers
- prioritise research and development that responds to the burden of disease and the contexts in which the most excluded children live.

WE CALL ON CIVIL SOCIETY TO:

- work with governments to support and strengthen immunisation and health systems, prioritising equity and those left behind
- hold governments accountable for delivering on health, immunisation and financing commitments
- engage in monitoring and accountability frameworks at local, national, regional and global levels.

Appendix: Research methodology

The analysis in this report is rooted in qualitative and quantitative research. The qualitative research is based on a desk review of recent literature on immunisation. Research for national spotlights on Nigeria, Ethiopia and Indonesia is based on literature reviews, the most recent national documentation, data from Demographic and Health Surveys (DHS), an analysis of national health and immunisation financing data in Nigeria and Ethiopia, and key informant interviews and focus group discussions in Indonesia.

For the quantitative research, analysis of national immunisation coverage is based on WHO/UNICEF Estimates of National Immunization Coverage (WUENIC). The analysis of inequalities is based on data from national DHS and Multiple Indicator Cluster Surveys (MICS) since 2010. For inequalities across ethnic groups, we have only included groups for which the sample size exceeds 100. Changes in inequalities compare DHS/MICS data since 2010 for countries where a previous survey is available.

For the Immunisation Equity Scorecard, national coverage is based on WUENIC DTP3 data from 2015, while national progress looks at a change in coverage between 2010 and 2015. Equity performance is based on the difference in DTP3 coverage between the wealthiest and poorest households in a country's most recent DHS or MICS survey (again, since 2010). Equity progress is based on the level of change between the two most recent surveys. Classifications for national performance are based on those used in WHO's National Immunisation Coverage Scorecards. For equity performance, we have applied the criteria used in the GVAP Secretariat report.

The estimate of lives that could be saved from closing the equity gap in 52 low- and middle-income countries is based on an analysis using the Lives Saved Tool (LiST). This looked at the impact of scaling up coverage of five vaccines (DTP, measles, Hib, pneumococcal and rotavirus) to the coverage for the top wealth quintile (the richest) in the next year (2015). To get at this "richest" coverage target for 2015, ratios of vaccine coverage of the top wealth quintile to national coverage from the last reported DHS/MICS survey were multiplied to the last reported 2014 WHO/UNICEF coverage estimate for the country. Ratios were created for countries with richest and national vaccine coverage data from survey years dating back to 2010. Where coverage of the wealthiest quintile was lower than national coverage, the latter percentage was used. We assumed the ratio of vaccine coverage between the wealthiest quintile and national coverage to be constant between the last reported estimates and the year 2015. For countries with national coverage estimates but no estimates of coverage for the wealthiest quintile for Hib, pneumococcal and rotavirus vaccines, the DTP vaccine coverage ratios were used to find the wealthiest coverage target. Coverage for the wealthiest quintile was kept constant between 2015 and 2020.

Endnotes

EXECUTIVE SUMMARY

[1] Including from cervical cancer, diphtheria, hepatitis B, measles, mumps, pertussis (whooping cough), pneumonia, polio, rotavirus diarrhoea, rubella and tetanus. Source: WHO, *Immunisation coverage: Factsheet*, 2016, http://www.who.int/mediacentre/factsheets/fs378/en/ accessed 5 April 2016

[2] UNICEF, Levels & Trends in Child Mortality 2015, UNICEF, 2015

[3] R Rheingans with O Cumming, J Anderson and J Showalter, *Estimating inequities in sanitation-related disease burden and estimating the potential impacts of pro-poor targeting*, London School of Hygiene and Tropical Medicine and SHARE, 2012

[4] This is based on a Lives Saved Tool (LiST) analysis of the number of child deaths that could be averted in 52 low and middle income countries between 2015 and 2020 if vaccination coverage of five vaccines (DTP, Hib, Measles, Rotavirus, Pneumococcal) was scaled up to coverage of their top wealth quintile in the next year.

[5] This refers to coverage of three doses of a diphtheria-tetanus-pertussis containing vaccine. This is a typical measure of routine immunisation and often used to measure the strength of immunisation and health systems as it requires three contacts with the health system at appropriate times and because it is given through routine national immunisation programmes rather than campaigns. Source of data: WHO, *Global Health Observatory data repository*, 2016, http://apps.who.int/gho/data/node.home accessed 15 March 2016

[6] WHO, *Immunisation coverage: Factsheet*, 2016, http://www.who.int/mediacentre/factsheets/fs378/en/ accessed 5 April 2016

[7] UNICEF, *Two-thirds of unimmunized children live in conflict-affected countries*, Press Release, 2016, www.unicef.org/media/media_90987.html accessed 10 May 2016

[8] See Save the Children webpage, 'Every last child deserves a future': http://www.savethechildren.org/site/c.8rKLIXMGIpI4E/b.9387359/k.9F03/Every_Last_Child.htm?msource=weklpelc0416

[9] WHO, *Health in the 2030 Agenda for sustainable development, Report by the Secretariat*, A69/15, 2016, http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_15-en.pdf accessed 15 May 2016

[10] This in outlined in the Declaration of Transforming our world: the 2030 Agenda for Sustainable Development. See also outcome of the Third International Conference on Financing for Development held in Addis Ababa

[11] B Shea, N Andersson and D Henry, 'Increasing the demand for childhood vaccination in developing countries: A systematic review', *BMC International Health and Human Rights*, 9, 1, 2009, p S5

[12] UNICEF, The State of the World's Children 2007, UNICEF, 2006

[13] See note 11 (in 'Executive summary')

[14] R Steinglass, 'Routine immunisation: an essential but wobbly platform', Global Health: Science and Practice, 1, 3, 2013, pp 295–301

1 INTRODUCTION

[1] This refers to coverage of three doses of a diphtheria-tetanus-pertussis containing vaccine. This is a typical measure of routine immunisation and often used to measure the strength of immunisation and health systems as it requires three contacts with the health system at appropriate times and because it is given through routine national immunisation programmes rather than campaigns. Source of data: WHO, *Global Health Observatory data repository*, 2016, http://apps.who.int/gho/data/node.home accessed 15 March 2016

[2] Global immunisation coverage has reached 86%. That leaves 14% of children not covered, i.e. 1 in seven children.

[3] WHO, *Immunisation coverage: Factsheet*, 2016, http://www.who.int/mediacentre/factsheets/fs378/en/ accessed 5 April 2016

[4] See Save the Children webpage, 'Every last child deserves a future': http://www.savethechildren.org/site/c.8rKLIXMGIpI4E/b.9387359/k.9F03/Every_Last_Child.htm?msource=weklpelc0416

[5] Including from cervical cancer, diphtheria, hepatitis B, measles, mumps, pertussis (whooping cough), pneumonia, polio, rotavirus diarrhoea, rubella and tetanus. Source: see note 3 (in '1 Introduction')

[6] UNICEF, Levels & Trends in Child Mortality 2015, UNICEF, 2015

[7] Against pneumococcal and Haemophilus influenzae type b pneumonia and meningitis, rotavirus, pertussis, measles, and malaria.

[8] S Ozawa, M L Stack, D M Bishai, A Mirelman, I K Friberg, L Niessen, D G Walker and O S Levine, 'During the 'Decade of vaccines,' the lives of 6.4 million children valued at $231 billion could be saved', *Health Affairs*, 30, 6, 2011, pp 1010–1020

[9] M Jit, R Hutubessy, M Ee Png, N Sundaram, J Audimulam, S Salim and J Yoong, 'The broader economic impact of vaccination: Reviewing and appraising the strength of evidence, *BMC Medicine*, 13, 2015, p 209

[10] A Glassman, J Ignacio Zoloa and D Duran, *Measuring government commitment to vaccination*, CGD Policy Paper 008, Center for Global Development, 2012

[11] Efficacious vaccines can also reduce disease transmission among unimmunised individuals in the community through 'indirect effects' or 'herd protection'. When a sufficient percentage of the population is vaccinated, the spread of the infectious agent declines. 'Herd protection' occurs when the reduction in disease incidence is greater than the proportion of individuals immunised. The coverage rate necessary to stop transmission depends on the particular disease. For example, measles requires very high coverage to attain herd protection. Source: F E Andre, R Booy, H L Bock, J Clemens, S K Datta, T J John, B W Lee, S Lolekha, H Peltola, T A Ruff, M Santosham, and H J Schmitt, 'Vaccination greatly reduces disease, disability, death and inequity worldwide', *Bulletin of the World Health Organization*, 86, 2, 2008, pp 81–160

[12] R Rheingans with O Cumming, J Anderson and J Showalter, Estimating inequities in sanitation-related disease burden and estimating the potential impacts of pro-poor targeting, London School of Hygiene and Tropical Medicine and SHARE, 2012

[13] This is based on a Lives Saved Tool (LiST) analysis of the number of child deaths that could be averted in 52 low and middle income countries between 2015 and 2020 if vaccination coverage of five vaccines (DTP, Hib, Measles, Rotavirus, Pneumococcal) was scaled up to coverage of their top wealth quintile in the next year.

[14] M Stack, S Ozawa, D M Bishai, A Mirelman, Y Tam, L Niessen, D G Walker and O S Levine, 'Estimated Economic Benefits During The 'Decade of vaccines' include treatment savings, gains In labor productivity', *Health Affairs*, 30, 6, 2011, pp 1021–1028

[15] S Ozawa, A Mirelman, M L Stack, D G Walker and O Levine, 'Cost-effectiveness and economic benefits of vaccines in low-and middle-income countries: A systematic review', *Vaccine*, 31, 2012, pp 96–108

[16] Return on investment is based on achieving projected coverage levels for vaccinations to prevent diseases related to ten antigens in 94 low- and middle-income countries between 2011 and 2020, the Decade of Vaccines. Source: S Ozawa, S Clark, A Portnoy, S Grewal, L Brenzel and D G Walker, 'Return on investment from childhood immunization in low- and middle-income countries, 2011–20', *Health Affairs*, 35, 2, 2015, 199–207

[17] This right is protected by the Universal Declaration of Human Rights and by Article 24 of the United Nations Convention on the Rights of the Child.

[18] V P Arauco, H Gazdar, P Hevia-Pacheco, N Kabeer, A Lenhardt, S Q Masood, H Naqvi, N Nayak, A Norton, N S Sabharwal, E Scalise, A Shepherd, D Thapa, S Thorat, D Hien Tran, L Vergara-Camus, T Woldehanna and C Mariotti, *Strengthening social justice to address intersecting inequalities post-2015*, ODI, 2014

[19] Save the Children, *Every Last child: The children the world chooses to forget*, Save the Children, 2016

[20] The "Continuum of Care" for reproductive, maternal, newborn and child health (RMNCH) includes integrated service delivery for mothers and children from pre-pregnancy to delivery, the immediate postnatal period, and childhood. Such care is provided by families and communities, through outpatient services, clinics and other health facilities. See: http://www.who.int/pmnch/about/continuum_of_care/en/

[21] Save the Children, *A common cause: Reaching every woman and child through Universal Health Coverage*, Save the Children, 2016

[22] WHO, Global vaccine action plan 2011-2020, World Health Organization, 2013

[23] Equity is one of six guiding principles of the Plan.

[24] This is a typical measure of routine immunisation and often used to measure the strength of immunisation and health systems as it requires three contacts with the health system at appropriate times and because it is given through routine national immunisation programmes rather than campaigns.

[25] Based on analysis of WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) data.

[26] See note 22 (in '1 Introduction')

[27] According to the 2014 and 2015 Strategic Advisory Group of Experts on Immunization (SAGE) GVAP Assessment reports, the only goal on track is the introduction of new and under-utilised vaccines in low and middle income countries.

[28] WHO/UNICEF estimates of immunization coverage for 2014.

[29] In the Eastern Mediterranean, average regional coverage is declining, likely due to conflict in the area.

[30] In this report the term unimmunised is used. It is defined as a child aged 12–23 months who has not received three doses of DTP. This includes underimmunised children – ie, children who have had some vaccination but haven't completed their basic series – as well as children who have had no immunisations at all. This definition is drawn from: John Snow Inc., *Epidemiology of the unimmunized child: Findings from the grey literature*, IMMUNIzATIONbasics Project, World Health Organization, 2009

[31] WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) data.

[32] WHO, *WHO vaccine-preventable diseases: monitoring system: 2016 global summary*, 2016, http://apps.who.int/immunization_monitoring/globalsummary/ accessed 10 May 2016

[33] WHO, *Global Health Observatory (GHO) data – immunisation*, 2016, http://www.who.int/gho/immunization/en/ accessed 5 April 2016

[34] The Scorecard includes data for 75 Countdown countries. See: http://www.countdown2015mnch.org. These countries have been selected as this is a globally defined grouping. We recognise that some of these countries may have made progress since the establishment of Countdown and that it may not include other critical countries with poor national and equity performance.

[35] For the Scorecard, national coverage is based on WUENIC DTP3 data from 2015, while national progress looks at a change in coverage between 2010 and 2015. Equity performance is based on the difference in DTP3 coverage between the wealthiest and poorest households in a country's most recent DHS or MICS survey (since 2010). Equity progress is based on the level of change between the most recent two surveys. Classifications for national performance are based on those used in WHO's National Immunisation Coverage Scorecards. For equity performance, we have applied the criteria used in the GVAP Secretariat report. See: http://www.savethechildren.org.uk/sites/default/files/images/Immunisation_equity_scorecard.pdf

2 WHO IS BEING LEFT BEHIND?

[1] A M Hilber, X Bosch-Capblanch, C Schindler, L Beck, F Sécula, O McKenzie, S Gari, C Stuckli and S Merten, *Gender and immunisation summary report for SAGE*, Swiss TPH and World Health Organisation, 2010; S Merten, A M Hilber, C Biaggi, F Secula, X Bosch-Capblanch, P Namgyal and J Hombach, 'Gender determinants of vaccination status in children: Evidence from a meta-ethnographic systematic review', *PLoS ONE*, 10, 8, 2015

While generally there aren't national trends showing one sex being favoured, in some countries disparities between boys and girls become apparent in certain communities.

[2] Data from India has not been included in the analysis in the subsequent sections looking at children being left behind as these sections are based on full national DHS and MICS surveys carried out since 2010, whereas only the first stage of India's current survey has been completed. Nonetheless, based on this initial data, clear inequalities emerge and hence a box has been included to shed light on this.

[3] M Mamatha and V N Rao, 'Immunization coverage in India: A study by using NFHS-III data', *Indian Journal of Applied Research*, 5, 12, 2015, pp 531–533

[4] See note 3 (in '2 Who is being left behind?')

[5] The data used for this analysis is based on the first phase of the National Family Health Survey (NFHS-4), 2015–16, which was carried out in 15 states and union territories. This does not represent a complete picture of all states across the country as data collection for the second phase is currently ongoing, however, it sheds light on the inequalities in the country. Source: http://rchiips.org/nfhs/nfhs4.shtml

[6] X Bosch-Capblanch, *Who are those communities unreached by immunisation services?*, 3ie Evidence Portal – Immunisation, Issues 6, Swiss TPH, 2015; Save the Children, Finding the final fifth: Inequalities in immunisation, Save the Children, 2012

[7] R P Pande and A S Yazbeck, *Beyond national averages for immunisation in India: Income, gender, and regional inequalities*, The World Bank, 2002

[8] Based on relative inequality, ie, the ratio between coverage of the wealthiest and poorest households, for countries that have carried out a DHS or MICS survey since 2010. Some countries may have seen progress since their last survey, while other national surveys may show higher coverage, but DHS/MICS surveys have been analysed for comparability across countries. Other countries may have worse inequalities but have not been included due to unavailability of recent data. The same applies for other dimensions of inequalities that have been analysed for this report.

[9] In this report we look at both DTP3 coverage (as a measure of basic routine immunisation coverage as it requires three visits with a health service) and full immunisation coverage of all antigens included in a

national vaccination package. Inequalities tend to widen when looking at the full package, which indicates that while some children are left behind from accessing even the most basic vaccines, exclusion worsens when it comes to accessing all immunisations they should be receiving.

[10] S Merten, A M Hilber, C Biaggi, F Secula, X Bosch-Capblanch, P Namgyal and J Hombach, 'Gender determinants of vaccination status in children: Evidence from a meta-ethnographic systematic review', *PLoS ONE*, 10, 8, 2015

[11] Despite immunisation services being free of charge, there are cases of public facilities charging for services (e.g. see Babirye et al, 2014). Public providers may charge patients or due to supply shortage, families may be required to purchase some supplies needed for immunisation. In the absence of pubic services in some contexts, families may face prohibitive private sector fees.

[12] M K Mutua, E Kimani-Murage and R R EttarhMutua, 'Childhood vaccination in informal urban settlements in Nairobi, Kenya: Who gets vaccinated?', *BMC Public Health*, 11, 6, 2011

[13] Cited in: X Bosch-Capblanch, *Who are those communities unreached by immunisation services?*, 3ie Evidence Portal – Immunisation, Issue 6, Swiss TPH, 2015

[14] S Merten, A M Hilber, C Biaggi, F Secula, X Bosch-Capblanch, P Namgyal and J Hombach, 'Gender determinants of vaccination status in children: Evidence from a meta-ethnographic systematic review', *PLoS ONE*, 10, 8, 2015

[15] This is an update of our previous analysis in *Finding the final fifth: Inequalities in immunisation*, using surveys since 2010.

[16] See note 14 (in '2 Who is being left behind?')

[17] Save the Children, *Every Last child: The children the world chooses to forget*, Save the Children, 2016

[18] Literature review: Reasons children are not vaccinated in low and middle income countries, Country facts sheets & global matrix, 2009 October 1, 2009, http://www.who.int/immunization/sage/1_CDC_Global_Matrix_Country_facts.pdf accessed 16 May 2016

[19] A Sumner, *The new face of poverty: How has the composition of poverty in low income and lower middle income countries (excluding China) changed since the 1990s?*, IDS Working Paper No 408, ODI and IDS, 2012

[20] J N Babirye, I M S Engebretsen, E Rutebemberwa, J Kiguli, and F Nuwaha, 'Urban settings do not ensure access to services: Findings from the immunisation programme in Kampala Uganda', *BMC Health Services Research*, 14, 111, 2014

[21] See note 12 (in '2 Who is being left behind?')

[22] Cited in Matua et al, 2012, See note 12 (in '2 Who is being left behind?')

[23] A B Awoh and E Plugge, 'Immunisation coverage in rural–urban migrant children in low and middle-income countries (LMICs): a systematic review and meta-analysis', *J Epidemiol Community Health*, 70, 2016, pp 305–311

[24] C Oluwadare, 'The social determinants of routine immunisation in Ekiti state of Nigeria', *Ethno-Med*, 3, 1, 2009, pp 49–56

[25] UNICEF, *Two-thirds of unimmunized children live in conflict-affected countries*, press release, 2016, www.unicef.org/media/media_90987.html accessed 20 May 2016

[26] Based on an analysis of *WUENIC dat.a*

[27] The Lancet, Human resources for health – investing in action. *The Lancet*, 387, 2016, p 1591

[28] See note 24 (in '2 Who is being left behind?')

[29] See note 26 (in '2 Who is being left behind?')

[30] See note 24 (in '2 Who is being left behind?')

[31] A Sparrow, *Syria's polio epidemic: The suppressed truth*, February 20, 2014 Issue, The New York Review of Books, 2014

[32] See note 24 (in '2 Who is being left behind?')

[33] WHO, *WHO vaccine-preventable diseases: monitoring system: 2016 global summary*, 2016, http://apps.who.int/immunization_monitoring/globalsummary/ accessed 10 May 2016

[34] J Mahjour, *WHO warns of increased risk of disease epidemics in Syria and in neighbouring countries as summer approaches*, World Health Organization Regional Office for Eastern Mediterranean, 2013, http://www.emro.who.int/press-releases/2013/disease-epidemics-syria.html accessed 10 April 2016

[35] S L Sharara and S S Kanj, 'War and infectious diseases: Challenges of the Syrian civil war', *PLoS Pathog*, 10, 11, 2014

[36] S Witter, 'Universal health coverage amid conflict and fragility: ten lessons from research', *The Lancet Global Health blog*, 2015, http://globalhealth.thelancet.com/2015/12/14/universal-health-coverage-amid-conflict-and-fragility-ten-lessons-research?platform=hootsuite accessed 10 April 2016

[37] See note 24 (in '2 Who is being left behind?')

3 CRITICAL ISSUES THAT MUST BE ADDRESSED

[1] X Bosch-Capblanch, *Who are those communities unreached by immunisation services?*, 3ie Evidence Portal – Immunisation, Issue 6, Swiss TPH, 2015

[2] WHO, *Global Health Observatory (GHO) data – immunisation*, 2016, http://www.who.int/gho/immunization/en/ accessed 5 April 2016

[3] National Institute of Health Research and Development, Ministry of Health, 2013 Basic Health Research (RISKESDAS), 2013; Biro Pusat Statistik (Statistics Indonesia) 2014

[4] Statistics Indonesia (Badan Pusat Statistik – BPS), National Population and Family Planning Board (BKKBN), Kementerian Kesehatan (Kemenkes – MOH) and ICF International, Indonesia Demographic and Health Survey 2012, BPS, BKKBN, Kemenkes and ICF International, 2013

[5] West Java is regarded as one of the biggest contributors to the maternal and infant mortality rate in Indonesia.

[6] Of the 34 provinces in Indonesia, NTT is one the worst-performance province with high maternal and child mortality.

[7] District governments now take responsibility to support operational and handling costs for running their immunisation programmes.

[8] Responsibility for vaccines, cold chain, supplies (including syringes), technical guidelines, monitoring and evaluation and quality control was retained by the central government.

[9] This is a method where the district level staff and the health facility level staff review the performance of immunisation service delivery in the area.

[10] Save the Children, 'Review of the immunisation programme in Indonesia: A study in two districts', Save the Children, forthcoming, 2016

[11] See World Health Organization webpage on 'Immunization, vaccines and biologicals': http://www.who.int/immunization/programmes_systems/service_delivery/red/en/ and UNICEF presentation on 'Achieving equity in immunization through reaching every community': http://www.unicef.org/supply/files/1.UNICEF_Equity_for_SD.pdf

[12] Based on a needs-based shortage of health-care workers in 2013. Source: WHO, *Global strategy on human resources for health: Workforce 2030, Draft for the 69th World Health Assembly*, World Health Organization, 2016

[13] This refers to a range of services that are targeted by UHC and the SDGs, including noncommunicable diseases, maternal, newborn and child health, and infectious disease priorities. Skilled health workers refers to physicians, nurses and Midwives. Source: see note 10 (in '3 Critical issues that must be addressed')

[14] Global Health Workforce Alliance, *Global key messages*, WHO, 2014, http://who.int/workforcealliance/media/key_messages_2014.pdf accessed 12 April 2016

[15] WHO, *Health workforce and services Draft global strategy on human resources for health: Workforce 2030, Report by the Secretariat*, EB138/36, 2015, http://apps.who.int/gb/ebwha/pdf_files/EB138/B138_36-en.pdf?ua=1 accessed 12 April 2016

[16] Routine immunisation includes delivery of immunisation through fixed sites (at a health facility), outreach (health facility staff leave the facility to deliver services) and mobile services (mobile teams visit a circuit of remote areas). See: IMMUNISATIONbasics Project, *Periodic intensification of routine immunisation – Lessons learned and implications for action*, WHO, 2009

[17] The GVAP specifies that: "Immunisation service delivery should continue to serve as a platform for providing other priority public health interventions" and that "other priority programmes should also serve as a platform for delivering immunisation. Every contact with the health sector should be used as an opportunity to verify immunisation status and provide immunisation where indicated." Source: WHO, *Global Vaccine Action Plan (GVAP) 2011–2020*, WHO, 2013

[18] R Steinglass, 'Routine immunisation: an essential but wobbly platform', *Global Health: Science and Practice*, 1, 3, 2013, pp 295–301

[19] Immunisation usually has higher and more equitable coverage than other primary services. WHO, Health in 2015: From MDGs to SDGs, WHO, 2015

[20] UNICEF, Two-thirds of unimmunized children live in conflict-affected countries, press release, 2016, www.unicef.org/media/media_90987.html accessed 20 May 2016

[21] PATH, John Snow, Inc., VillageReach, the Bill & Melinda Gates Foundation and Gavi, the Vaccine Alliance, Next-generation immunisation supply chains are needed to improve health outcomes, PATH, 2015

[22] O S Kumrua, S B Joshi, D E Smith, C R Middaugh, T Prusik and D B Volkin, 'Vaccine instability in the cold chain: Mechanisms, analysis and formulation strategies', *Biologicals*, 42, 5, 2014, pp 237–259; M V Murhekar, S Dutta, A N Kapoor, S Bitragunta, R Dodum, P Ghosh, K K Swamy, K Mukhopadhyay, S Ningombam, K Parmar, D Ravishankar, B Singh, V Singh, R Sisodiya, R Subramanian and T Takum, 'Frequent exposure to suboptimal temperatures in vaccine cold-chain system in India: results of temperature monitoring in 10 states', Bulletin of the World Health Organization, 91, 2013, pp 906–913

[23] The government is now moving towards a model of three HEWs per post (one in a senior position).

[24] See note 22 (in '3 Critical issues that must be addressed')

[25] See note 22 (in '3 Critical issues that must be addressed')

[26] M Zaffran, K D Vandelaer, B Melgaard, P Yadav, K O Antwi-Agyei and H Lasher, 'The imperative for stronger immunisation supply and logistics systems', *Vaccine*, 31, 2, 2013, pp B73–B80

[27] See note 22 (in '3 Critical issues that must be addressed')

[28] See note 26 (in '3 Critical issues that must be addressed')

[29] The Supply Chain Hub coordinates support to Member States and provides updated guidance material, tool and technical assistance.

[30] See Gavi webpage on 'Cold chain equipment optimisation platform': http://www.gavi.org/support/hss/cold-chain-equipment-optimisation-platform/

[31] Institute for Health Metrics and Evaluation, Financing global health 2014: Shifts in funding as the MDG era closes, IHME, 2015

[32] WHO, *Health in the 2030 Agenda for sustainable development, Report by the Secretariat*, A69/15, 2016, http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_15-en.pdf accessed 15 May 2016

[33] This in outlined in the Declaration of Transforming our world: the 2030 Agenda for Sustainable Development, see: https://sustainabledevelopment.un.org/post2015/transformingourworld. Also see outcome of the Third International Conference on Financing for Development held in Addis Ababa: http://www.un.org/esa/ffd/ffd3/

[34] See note 32 (in '3 Critical issues that must be addressed'); Save the Children, *Making a killing: How tax scams are robbing poor countries of life-saving healthcare*, Save the Children, 2015

[35] WHO, Global vaccine action plan 2011–2020, World Health Organization, 2013

[36] Fiscal space is the ability of a country's government to make budgetary resources available for specific use without undermining the sustainability of that country's financial position. In the context of health, this means being able to increase spending in the sector without affecting expenditure in different sectors needed to achieve other development objectives. See: https://www.savethechildren.org.uk/sites/default/files/images/Within_Our_Means.pdf

[37] L Brenzel, C Schütte, K Goguadze, W Valdez, J B Le Gargasson and T Guthrie, 'EPIC studies: Governments finance, on average, more than 50 percent of immunization expenses, 2010–11', *Health Affairs*, 35, 2, 2016, pp 259–265

[38] Health Affairs, *Vaccines*, 2016, http://www.healthaffairs.org/events/2016_02_09_vaccines/media/slides.pdf accessed 8 April 2016; M McQuestion, A Carlson, K Dari, D Gnawali, C Kamara, H Mambu-Ma-Disu, J Mbwanque, D Kizza, D Silver and E Paatashvili, 'Routes countries can take to achieve full ownership of immunisation programs, *Health Affairs*, 35, 2, 2016, pp 266–271

[39] Based on a WHO analysis of expenditures reported by 92 countries. Data is based on reporting on the JRF indicator "government expenditure on routine immunisation" which includes recurrent immunisation-specific expenditures for routine immunisation financed by the government. It includes expenditures for routine vaccines (traditional, new and underused) and vaccine co-financing payments using government funds, associated injection supplies, salaries and per diems of health staff working full-time on immunisation, transport specific for immunisation, vehicles and cold-chain maintenance, immunisation-specific training, social mobilisation, monitoring and surveillance, and programme management. Shared health system costs are excluded from this indicator. Source: WHO, Global vaccine action plan: Monitoring, evaluation & accountability, Secretariat annual report 2015, World Health Organization, 2015

[40] Cited in: See note 37 (in '3 Critical issues that must be addressed')

[41] This is the cost to immunise a child against 11 diseases (tuberculosis, measles, rubella, diphtheria, tetanus, pertussis, hepatitis B, Haemophilus influenzae type b, poliomyelitis, pneumococcal diseases, rotavirus, not including human papillomavirus for adolescent girls), based on Gavi prices. The cost is much higher for countries not eligible to access Gavi prices. Source: MSF, The right shot: Bringing down barriers to affordable and adapted vaccines, 2nd Edition – January 2015, MSF, 2015

[42] This is the estimate of health system delivery costs to deliver routine immunisation for the period 2016–2020. Around 63% is for service delivery and 37% for supply chains and logistics. This figure increased from $18.1 in 2010 to $24.9 during the period 2011–2015. Source: P Lydon, G Gandhi, J Vandelaer and J M Okwo-Bele, 'Health system cost of delivering routine vaccination in low- and lower-middle income countries: What is needed over the next decade?' *Bull World Health Organ*, 92, 2014, 382–384

[43] S Machingaidze, C S Wiysonge and G D Hussey, 'Strengthening the expanded programme on immunisation in Africa: Looking beyond 2015, *PLoS Med*, 10, 3

[44] M Moeti and A Alwan, *Africa: Now is the time to reach every child with life-saving vaccines*, 2016, http://www.afro.who.int/en/rdo/articles/4870-africa-now-is-the-time-to-reach-every-child-with-life-saving-vaccines.html accessed 15 April 2016

[45] H Saxenian, R Hecht, M Kaddar, S Schmitt, T Ryckman and S Cornejo, 'Overcoming challenges to sustainable immunisation financing: Early experiences from GAVI graduating countries', *Health Policy and Plan*, 10, 2014, pp 1–9

[46] A recent study found that among GAVI-eligible countries studied (Bangladesh, Cameroon, Ethiopia, Kenya and Mali), a primary factor driving decisions to adopt new vaccines was to seize the opportunity

of Gavi funding. Source: H E D Burchett, S Mounier-Jack, U K Griffiths, R Biellik, P Ongolo-Zogo, E Chavez, H Sarma, J Uddin, M Konate, Y Kitaw, M Molla, S Wakasiaka, L Gilson and A Mills, 'New vaccine adoption: Qualitative study of national decision-making processes in seven low- and middle-income countries, *Health Policy and Plan*, 27, 2012, ii5–ii16

[47] See: http://www.immunisationcosting.org/

[48] In Ghana, for example, Gavi financing rose from 1% to 20% of total financing and government funding declined from 98% to 79%. There was, however, there was an absolute increase in government financing overall. Source: see note 37 (in '3 Critical issues that must be addressed')

[49] See note 37 (in '3 Critical issues that must be addressed')

[50] M McQuestion, A Carlson, K Dari, D Gnawali, C Kamara, H Mambu-Ma-Disu, J Mbwanque, D Kizza, D Silver and E Paatashvili, 'Routes countries can take to achieve full ownership of immunisation programs, *Health Affairs*, 35, 2, 2016, pp 266–271

[51] Health Affairs, *Vaccines*, 2016, http://www.healthaffairs.org/events/2016_02_09_vaccines/media/slides.pdf accessed 8 April 2016

[52] Countdown countries were identified in 2005 to track progress in the 75 countries where more than 95% of all maternal and child deaths occur. See: http://www.countdown2015mnch.org

[53] Save the Children, *Within our means: Why countries can afford universal health coverage*, Save the Children, 2015

[54] Cited in: Save the Children, *Every last child: The children the world chooses to forget*, Save the Children, 2016

[55] Measured by DTP3. Source: Save the Children, *State of the Nigerian Children 2015: Children left behind in Nigeria*, Save the Children 2016

[56] See note 55 (in '3 Critical issues that must be addressed')

[57] See note 55 (in '3 Critical issues that must be addressed')

[58] The dropout rate shows the ability of the health system to provide the recommended number of doses of vaccines that require multiple doses. See: E Bos and A Batson, *Using Immunisation coverage rates for monitoring health sector performance: Measurement and interpretation issues*, Health, nutrition and population (HNP) discussion paper, 2000

[59] C Wonodi, C Stokes-Prindle, M Aina, G Oni, T Olukowi, M A Pate, L Privor-Dumm and O Levine, *Landscape analysis of routine immunisation in Nigeria*, International Vaccine Access Center John Hopkins Bloomberg School of Public Health, 2012

[60] Gavi, *Guidelines for preparing a national immunisation program*, Financial Sustainablity and Plan, 2004

[61] K Ojo, I Yisa, A Soyibo, L Olubajo and P Schoen, *Cost of routine immunisation in Nigeria*, Centre for Health Economics and Development, 2011

[62] National Primary Health Care Development Agency, National routine immunisation strategic plan 2013–2015

[63] National Vaccine Financing Task Group, Vaccine financing investment case, 2015

[64] See note 62 (in '3 Critical issues that must be addressed')

[65] Nigeria cMYP 2016–2020

[66] The study used the Expanded Program on Immunisation Costing (EPIC) methodology focusing attention on determining facility-level total and unit costs, and reasons for their variation; financial flow analysis of the RI program; new vaccine introduction cost; and comparisons from a government perspective. See: C Schütte, 'Cost analysis of routine immunisation in Zambia', *Elsivier*, 2015, p A47

[67] No state surveyed had committed enough to routine immunisation according to the expectation detailed in the National routine immunisation strategic plan

[68] A Meghani, A Abdulwahab, L Privor-Dumm and C Wonodi, *Basket funds: A pooled arrangement to finance primary health care delivery and address the funding flow in Nigeria*

[69] R Levin, S England and V Mitchell, *Immunisation financing options: Resources for policymakers*, Gavi, 2002

[70] Save the Children, Nigeria routine immunization financing study, Save the Children, forthcoming

[71] WHO, *Global health observatory (GHO) data*, 2016, http://www.who.int/gho/database/en/ accessed 15 May 2016

[72] These regions face low literacy, poor public services and infrastructure and low human capacity. See: http://www.uncdf.org/sites/default/files/Documents/erdp_54573_prodoc_0.pdf

[73] Central Statistical Agency (Ethiopia) and ICF International, Ethiopia demographic and health survey 2011, Central Statistical Agency and ICF International, 2012

[74] FMOH, *HSDP IV Annual performance Report*, 2013–2014

[75] See note 73 (in '3 Critical issues that must be addressed')

[76] T P Jackson and A Mills, 'A review of health resource tracking in developing countries', *Health Policy and Planning*, 22, 2007, pp 353–362

[77] Countdown to 2015 Maternal, Newborn & Child Survival, A decade of tracking progress for maternal, newborn and child survival: The 2015 report, UNICEF and World Health Organization, 2015

[78] World Bank, Ethiopia: National immunization program costing and financing assessment, World Bank, 2002

[79] Ethiopian Public Health Institute, Improving the health care financing in Ethiopia: An evidence brief for policy, 2014

[80] WHO Immunisation Data, 2014

[81] See note 80 (in '3 Critical issues that must be addressed')

[82] Financial allocation across regions are made based on 'allocation formula set every year by the House of Federation (the second chamber of the parliament). For example, this year the criteria included population size and revenue collection capacity of the region. Emerging regions also get additional support.

[83] Save the Children, Budget tracking: Allocation and utilization of RMNCH budget in Ethiopia, Save the Children, forthcoming

[84] This is an estimate for the four-year period from the start of 2011 to the end of 2014. Source: Gavi progress report 2014

[85] For example, it is an arbitrary quantification measures, lacks of commensurate categories, and based on weak data from underfunded statistics bureaus. Also, GNI per capita doesn't capture internal inequality. Source: S L M Davis, 'Who pays to fulfil health right? Aid eligibility, accountability and fiscal space', *Health and Human Rights Journal blog*, 2016

[86] See Gavi webpage, 'Countries eligible for support': http://www.gavi.org/support/apply/countries-eligible-for-support/

[87] S Dercon and N Lea, The missing middle – or is there an obvious resource gap for LMICs?, 2015

[88] See note 87 (in '3 Critical issues that must be addressed')

[89] This was proposed by the analytical team of the Equitable Access Initiative. Source: S L M Davis, 'Who pays to fulfil health right? Aid eligibility, accountability and fiscal space', *Health and Human Rights Journal blog*, 2016

[90] R Steinglass, 'Routine immunisation: An essential but wobbly platform', *Global Health: Science and Practice*, 1, 3, 2013, pp 295–301; Save the Children, Halfway there: Delivering on the promise of immunisation for all, Save the Children, 2013

[91] R Fields, *A Stakeholder Consultation on Investment Strategies for Routine Immunisation in Africa*, JSI Research & Training Institute, Inc., ARISE Project for the Bill & Melinda Gates Foundation, 2012

[92] Cited in: see note 90 (in '3 Critical issues that must be addressed')

[93] S Berkley, A new routine for vaccines and global health, 2016, https://www.linkedin.com/pulse/new-routine-vaccines-global-health-seth-berkley?forceNoSplash=true accessed 20 May 2016

[94] See web page on Gavi's strategy, 'Phase IV (2016-20)': http://www.gavi.org/about/strategy/phase-iv-2016-20/

[95] The Strategy indicators approved by the Gavi Board in December 2015 failed to include an explicit health system indicator to measure how Gavi contributes to stronger comprehensive primary care services, not solely immunisation. Moreover, the approved measure of immunisation spending should have included a complementary measure of health expenditure more broadly to ensure that increasing investment in immunisation is alongside growing national expenditure on health, rather than money merely being shifted away from other primary care services. This was only included as supplementary information that will be tracked voluntarily rather than mandatory reporting.

[96] According the May Gavi PPC paper, the proposed funding envelope for HSS during the next strategic period is still small, expected to be only around 16% of total programmatic expenditure. Source: Gavi May 2016 PPC paper 4.

[97] See Results, Putting immunization at the heart of health systems, 2016: http://www.results.org.uk/sites/default/files/files/Putting%20Immunisation%20at%20the%20Heart%20of%20Health%20Systems%20April%202016.pdf; and Polio Global Eradication Initiative presentation, 'Polio legacy: planning for a polio-free world': http://www.polioeradication.org/Portals/0/Document/Resources/Legacy/PolioLegacy_Planning.pdf

[98] K Storent, 'The GAVI Alliance and the 'Gates approach' to health system strengthening, *Global Public Health*, 9, 8, 2014, pp 865–79

[99] This includes ten countries with the most under-immunised children (Afghanistan, Chad, DR Congo, Ethiopia, India, Indonesia, Kenya, Nigeria, Pakistan and Uganda) and ten countries with high inequities or facing conflict (Central African Republic, Haiti, Madagascar, Mozambique, Myanmar, Niger, Papua New Guinea, Somalia, South Sudan and Yemen).

[100] See World Health Organization webpage, 'Nigeria is now free of Ebola virus transmission': http://www.who.int/mediacentre/news/ebola/20-october-2014/en/index2.html; and AO Odutolu, 'Nigeria's seven lessons from polio and Ebola response', blog post, World Bank, 1 May 2016 http://blogs.worldbank.org/health/nigeria-s-seven-lessons-polio-and-ebola-response

[101] This was an action area in the outcome document adopted at the Third International Conference on Financing for Development in Addis Ababa, Ethiopia, 13–16 July 2015 and endorsed by the General Assembly in its resolution 69/313 of 27 July 2015. See: http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf

[102] Data provided by WHO

[103] X Bosch-Capblanch, M Zuske and C Auer, *How does research on interventions to improve vaccination address equity and marginalised populations?*, 3ie Evidence Portal – Immunisation, Issue 8, Swiss TPH, 2015

[104] See note 103 (in '3 Critical issues that must be addressed')

[105] UNICEF, Every child's birth right: Inequities and trends in birth registration, UNICEF, 2013

[106] See note 106 (in '3 Critical issues that must be addressed')

[107] Save the Children, *Every last child: The children the world chooses to forget*, Save the Children, 2016

[108] This right is guaranteed in the Convention on the Rights of the Child and in other international treaties. See note 114, '3 Critical issues that must be addressed'

[109] C AbouZahr, D de Savigny, L Mikkelsen, P W Setel, R Lozano, E Nichols, F Notzon and A D Lopez, 'Civil registration and vital statistics: Progress in the data revolution for counting and accountability', *Lancet*, 386, 2015, pp 1373–85; see note 106 (in '3 Critical issues that must be addressed')

[110] B Shea, N Andersson and D Henry, 'Increasing the demand for childhood vaccination in developing countries: A systematic review', *BMC International Health and Human Rights*, 9, 1, 2009, p S5

[111] WHO, UNICEF and World Bank, State of the world's vaccines and immunisation, 3rd ed, WHO, 2009

[112] P Santiago, *Driving demand for immunisation*, Decade of Vaccines Collaboration News & Updates, 2011

[113] MSF, The right shot: Bringing down barriers to affordable and adapted vaccines, 2nd Edition – January 2015, MSF, 2015

[114] WHO, *Pneumonia Fact sheet N°331*, 2015, http://www.who.int/mediacentre/factsheets/fs331/en/ accessed 4 May 2016

[115] WHO and CHERG, WHO-CHERG methods and data sources for child causes of death 2000–2011, WHO, 2013

[116] Possibly due to intellectual property, regulatory and other barriers.

[117] See note 113 (in '3 Critical issues that must be addressed')

[118] WHO, *Immunization coverage fact sheet*, 2016, http://www.who.int/mediacentre/factsheets/fs378/en/ accessed 27 May 2016

[119] See note 115 (in '3 Critical issues that must be addressed)

[120] WHO provides guidelines on this. See: http://apps.who.int/iris/bitstream/10665/92462/1/WHO_IVB_13.07_eng.pdf

[121] This is currently Gavi prices.

[122] In line with WHA resolution 68.6.

[123] This is referred to as 'market failure'. See: Save the Children, Small Doses: Finding and making the medicines children need, Save the Children, 2016; See also: A Glassman, J I Zoloa and D Duran, *A Commitment to Vaccination Index: Measuring Government Progress toward Global Immunization*, CGD Policy Paper 009, Center for Global Development, 2012

[124] Save the Children, Small Doses: Finding and making the medicines children need, Save the Children, 2016

[125] See PATH webpage, Uniject™ injection system: http://sites.path.org/vpdt/safe-inject/ad-syringes/uniject/

[126] See PATH webpage, Dose-sparing and intradermal applications: http://sites.path.org/vpdt/dose-sparing-and-intradermal-applications/

[127] See PATH webpage, Temperature monitoring: http://sites.path.org/vpsse/cold-chain-innovations/temp-monitor/

[128] See PATH webpage, Controlled temperature chain: http://sites.path.org/vpsse/cold-chain-innovations/ctc/

[129] See PATH webpage, Solar direct-drive refrigerators: http://sites.path.org/vpsse/cold-chain-innovations/sdd-fridges/

[130] Save the Children, Small Doses: Finding and making the medicines children need, Save the Children, 2016; See also: A Glassman, J I Zoloa and D Duran, *A Commitment to Vaccination Index: Measuring Government Progress toward Global Immunization*, CGD Policy Paper 009, Center for Global Development, 2012

[131] The vaccine was developed through a partnership between WHO and PATH with strong support of the Bill & Melinda Gates Foundation. It was developed very quickly and at a tenth of the cost of a typical new vaccine. It has had a huge impact, breaking the cycle of meningitis A epidemics in the region and has since been used by more than 235 million people in 15 countries. In 1996, there were over 250,000 cases of Meningitis A across the Meningitis Belt. By 2015, the disease had been nearly eliminated with only 80 cases. Source: Mullan, 'Vaccines for Africa: a "limited market"?' *The Lancet*, 4, 3, 2016, p e137; See: http://www.meningvax.org/

[132] A M Hilber, X Bosch-Capblanch, C Schindler, L Beck, F Sécula, O McKenzie, S Gari, C Stuckli and S Merten, *Gender and immunisation summary report for SAGE*, Swiss TPH and World Health Organisation, 2010; S Merten, A M Hilber, C Biaggi, F Secula, X Bosch-Capblanch, P Namgyal and J Hombach, 'Gender determinants of vaccination status in children: Evidence from a meta-ethnographic systematic review', *PLoS ONE*, 10, 8, 2015

[133] UNICEF, The State of the World's Children 2007, UNICEF, 2006

[134] Low education level of both the primary caregiver and partner are strongly associated with the likelihood that a child will not be immunised, though a mother's education is found to be particularly important. Education is usually gendered to the disadvantage of women. Source: See note 132 (in '3 Critical issues that must be addressed')

[135] S Merten, A M Hilber, C Biaggi, F Secula, X Bosch-Capblanch, P Namgyal and J Hombach, 'Gender determinants of vaccination status in children: Evidence from a meta-ethnographic systematic review', *PLoS ONE*, 10, 8, 2015

[136] See note 1 (in '3 Critical issues that must be addressed')

[137] A M Hilber, O McKenzie, S Gari, C Stucki and S Merten, Gender and Immunisation: Summary report, Swiss Centre for International Health and Swiss TPH, 2010

[138] See note 135 (in '3 Critical issues that must be addressed')

[139] See http://www.who.int/immunisation/sage/1_immunisation_gender_reports_without_graphics.pdf

[140] Based on indicators of female empowerment, including the Gender Development Index and Female combined gross enrolment ratio.

[141] See note 1 (in '3 Critical issues that must be addressed')

[142] See Gavi webpage, 'Gender policy': http://www.gavi.org/about/governance/programme-policies/gender/

[143] B Shea, N Andersson and D Henry, 2009, 'Increasing the demand for childhood vaccination in developing countries: A systematic review', *BMC Internat Health and Human Rights*, 9, 1, p S5

[144] See note 10 (in '3 Critical issues that must be addressed')

[145] See note 143 (in '3 Critical issues that must be addressed')

[146] See note 135 (in '3 Critical issues that must be addressed')

[147] See note 139 (in '3 Critical issues that must be addressed')

[148] See note 135 (in '3 Critical issues that must be addressed')

[149] H Larson, *Measuring the vaccine confidence gap*, London School of Hygiene & Tropical Medicine

[150] For example, due to past population control or colonial health programmes.

[151] The Vaccine Confidence Project and LSHTM, The State of Vaccine Confidence 2015, LSHTM

4 CONCLUSION AND RECOMMENDATIONS

[1] See: http://www.who.int/immunisation/global_vaccine_action_plan/GVAP_doc_2011_2020/en/

[2] See: http://immunisationinafrica2016.org/ministerial-declaration-english/

[3] For example, see: http://arise.jsi.com; Save the Children, Immunisation for all: No child left behind, Save the Children, 2012; C Stokes-Prindle, C Wonodi, M Aina, G Oni, T Olukowi, M A Pate, L Privor-Dumm and O Levine, *Landscape analysis of routine immunization in Nigeria: Identifying barriers and prioritizing interventions*, IVAC

[4] UNICEF, Narrowing the gaps to meet the goals, UNICEF, 2010

[5] L Goeman, B Galichet, D G Porignon, P S Hill, N Hammami, M S Essengue Elouma, P Y Kadama and W Van Lerberghe, 'The response to flexibility: Country intervention choices in the first four rounds of the GAVI health systems strengthening applications', *Health Policy and Plan*, 25, 4, 2009, pp 292–299

[6] Cited in: A Glassman, J I Zoloa and D Duran, *A Commitment to Vaccination Index: Measuring Government Progress toward Global Immunization*, CGD Policy Paper 009, Center for Global Development, 2012

FURTHER, FASTER, FAIRER

Reaching every last child with immunisation

Progress in the coverage of immunisation services over the past decade has been impressive, with 86% of children globally now receiving basic vaccinations. However, there is cause for concern. Progress has recently slowed and the 2011–2020 Global Vaccine Action Plan is off-track. 19.4 million children under one year old – one in seven – are still excluded from the full benefits of immunisation. As this report shows, these excluded children are not evenly interspersed among other children who are being vaccinated. Instead they are concentrated in communities that are systematically excluded from progress.

Every child has the right to immunisation as part of their right to health. This report argues that domestic policy and resource choices must ensure that immunisation and other essential health services reach every last child, working towards Universal Health Coverage. It explores global factors that affect countries' ability to reach every last child, including a fairer and more equitable global tax system, development aid that is fit for purpose, access to affordable vaccines, and a research agenda that responds to the needs of countries where children are left behind. It also looks at other important issues that must be addressed for countries to make progress, including ensuring accountability to children, and tackling household and community-level barriers to reaching them with services.

Breaking down the barriers that drive exclusion is possible – but requires renewed political leadership, commitment and investment. Actors at all levels have a responsibility to ensure that every last child can realise their right to immunisation. This report puts forward recommendations for governments, development partners, the private sector and civil society to help drive this agenda forward. We must act now.

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