ROUTINE IMMUNIZATION STRENGTHENING IN POLIO HIGH-RISK GEOGRAPHIES: GENDER INTEGRATED APPROACH

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Executive Summary

Routine immunization is a key part of health care in the first years of life.¹ High coverage of childhood routine immunization protects against community spread and outbreaks of poliovirus.^{2–4} Understanding how gender norms, roles, and cultural restrictions influence access to immunization is critically important for addressing issues related to global vaccine inequity and is a key component of polio eradication.⁵ This report highlights findings from a literature review and expert interviews, synthesized in a landscape analysis focused on the influence of gender in routine immunization.

A team from the Strategic Analysis, Research & Training (START) Center at the University of Washington conducted a literature review and performed expert interviews in response to the Bill and Melinda Gates Foundation's (the Foundation) work order "Routine Immunization Strengthening in Polio High-Risk Geographies Gender Integration". The START Center worked with the Routine Immunization Strengthening in Polio High-Risk Geographies (RISP) and Gender Integration teams to identify areas within RISP's strategy that would lead to better programmatic outcomes were a gender lens incorporated. The geographic scope of this report is in the 10 RISP focus geographies: Afghanistan, Somalia, Central African Republic (CAR), South Sudan, Democratic Republic of Congo (DRC), Niger, Chad, Guinea, Nigeria, and Pakistan. Sections presented in this report are country context, identified gender factors, and finally, recommendations.

Considering gender in routine immunization activities includes ways in which both gender and gender norms influence accessing routine vaccines at five distinct, but interconnected levels: individual, household, community, health system, and policy.⁶ Through our research, we identified the following key opportunities and recommendations for increasing gender equity in immunization:

- COLLECT GENDER DISAGGREGATED DATA Gender disaggregated data on coverage, health care workers, and community leaders must be collected at local and national levels. Policy and funding must require measures of gendered indicators at regular intervals to track impact over time.
- TARGET INTERVENTIONS AT THE HEALTH SYSTEM LEVEL Gender factors influencing routine immunization are extensive; focusing on treatment of women in the health system, decision making around health care, and expanding services to encompass additional health care have the potential for major impact.
- 3. INTEGRATE COMMUNITY HEALTH WORKERS IN THE HEALTH SYSTEM Female CHWs have the potential to educate and expand services for hard-to-reach populations. Including CHW programs in government health planning and financing will strengthen these programs and provide protection to workers.
- IDENTIFY AREAS FOR SUBTLE CULTURAL SHIFTS In contexts with restrictive gender norms, opportunities for subtle shifts like including both parents in children's health care have the potential to be more successful.

Table of Contents

Executive Summary	1
Introduction	3
Methods	4
Literature Review Methods	4
Literature Search	4
Data Abstraction Methods	4
Framework Definitions	5
Country Context Methods	5
Results: Country Context	6
Conflict Settings	6
RISP Country Settings	6
Results: Gender & Immunization	7
Individual	7
Household	10
Community	11
Health System	15
Policy and Governance	17
Conclusion	20
Key Findings	20
Recommendations	20
Appendices	22
Appendix 1 – Tables and Figures	22
Appendix 2 - Country Profiles	25
Appendix 3 - Literature Search Criteria	35
References	36

Introduction

Overview

This Strategic Analysis and Research Training Program (START) team worked with the Routine Immunization Strengthening in Polio High-Risk Geographies (RISP) and Gender Integration teams to identify areas within RISP's strategy that would lead to better programmatic outcomes if a gender lens were incorporated. Through a comprehensive review of published literature and key informant interviews, the START team has provided an overview of what is known around routine immunization activities and how gender influences programmatic success. Understanding gender-related barriers is key to expanding access to vaccines and increasing coverage, benefiting children regardless of the recipient's gender.⁵ As the RISP team's focus is on improving coverage of routine immunization, not vaccination campaigns, barriers identified in this report are specific to routine immunization services and access to the health system in general.

The relationship between routine immunization and gender can be framed through five levels of an interconnected network including: Individual, Household, Community, Health System, and Policy.⁶ By considering a multi-level approach, we can identify gender-related barriers and data gaps to provide recommendations to improve gender intentionality of routine immunization activities. Although national level data suggests there are limited disparities in vaccination coverage by gender, the goal of this report is to go beyond one measure of immunization success and identify a nuanced understanding of barriers at all levels of routine immunization programming.⁷

Several factors known to be associated with improved immunization coverage including socioeconomic positioning, rurality, education, and typical use of medical services.⁷ Gender interacts with several social determinants of health, and influences access to health information and services, increases exposure to health risks, and adversely impacts health outcomes.⁸ Considering gender is essential to designing targeted approaches to improve immunization coverage for girls and boys.

Integrating gender into routine immunization services goes far beyond equal vaccination coverage for girls and boys.^{7,9} Although existing data shows little to no significant relationship between gender and routine immunization coverage at a national level, this does not mean gender integration would not improve coverage.⁷ Gender-barriers identified in this report include characteristics that influence the caregiver's access to services, gender of health care professionals, and the impact policies may have depending on gender.

The objective of this report is to describe the sociodemographic and immunization context of the countries of interest (Afghanistan, Somalia, Central African Republic (CAR), South Sudan, Democratic Republic of Congo (DRC), Niger, Chad, Guinea, Nigeria, and Pakistan) and to describe the association between gender and routine immunization on the individual, household, community, health system, and policy level.

Methods

Literature Review Methods

LITERATURE SEARCH

A literature search of peer-reviewed academic and non-academic ("gray") literature was performed using PubMed, Embase, and Google Scholar. PubMed and Embase have their own query language and had similar search strings. Search terms are included in Appendix 3. Google Scholar does not have a robust query language compared to the other databases used, thus the search strategy was shifted for this database. Articles that had information on childhood vaccinations and female empowerment (e.g., autonomy, decision making ability, agency, mobility, etc.) were included in the search. As the initial searches yielded few results in conflict settings, a second, targeted Google Scholar search was performed, focusing on conflict settings. As Google Scholar yielded thousands of results in both searches, only the first 200 results were screened in the first search. For the targeted search, 50 results were screened. After articles were obtained, duplicates were removed using titles and DOIs, where available.

The team screened titles and abstracts from PubMed, Embase, and Google Scholar using the following Inclusion and exclusion criteria:

- English language
- Full text available
- Any mention, in the title or abstract of the Expanded Program on Immunization (EPI), routine immunization, or childhood vaccines.
- Title or abstract mentioning gender, equity, equality, or barriers.

Exclusion criteria were as follows:

- Disease areas: COVID
- Western geographies and high-income countries
- Adolescent vaccinations (e.g., HPV)

DATA ABSTRACTION METHODS

Following the literature searches, articles were screened in two phases. In the first phase, titles were read, with particular attention to omit articles that appeared to discuss primarily vaccine manufacturing or articles in higher-resource settings. In the second phase, abstracts were read, and articles that focused on mass vaccination campaigns were excluded. Articles that appeared to discuss gender-barriers to childhood vaccination were included and articles were noted as to which level(s) of the framework they appeared to discuss. If articles passed both phases of screening, they were considered for full-text review. In the full-text review, articles were tagged based on which level(s) of the framework they discussed. Relevant quotes, data, and figures were pulled from this review and were used to inform discussions in this document.

FRAMEWORK DEFINITIONS

Several frameworks were considered to aid in reading and classifying relevant points in the literature. The final framework was adapted from the socioecological framework in Feletto *et al.*⁶ This framework is visualized in Appendix 1-- Figure 1 and consists of five levels, each of which interacts with one another and embodies the different contributing factors to childhood vaccination using a gendered lens. The five levels are as follows:

LEVEL	DEFINITION	COMMON EXAMPLES
Individual	Factors that can be intervened on a by- person basis and are not reliant on other people for measurement	Caregiver age, education, and literacy
Household	Factors that pertain to the family unit	Marital status, household dynamics, and household expectations
Community	Factors that affect larger regions and populations, which tend to be "ecological" measures	Regional socioeconomic status, rurality, religious and cultural influences
Health System	Factors that detail interactions with the healthcare system as a whole	Female patient experience, female doctors and nurses
Policy and Governance	Factors related to policies above the health care system	Leadership, influence of policy on different genders, regulation and protection of female health workers

COUNTRY CONTEXT METHODS

Country context was limited to evidence in the RISP focus geographies and can be categorized into three major strategic groupings: conflict settings (Afghanistan, Central African Republic, Democratic Republic of Congo, Somalia, South Sudan), systems building (Chad, Guinea, Niger, Nigeria), and a hybrid approach (Pakistan).

For each of these 10 countries, we looked for information on key variables that might affect gender related barriers within immunization including measures for gender equality, political stability, and immunization coverage disaggregated by sex.

Finally, we sourced country level and gender related information from the GAVI Joint appraisal reports. The joint appraisal is an in-country, multi-stakeholder review of the implementation progress and performance of Gavi's vaccine and cash grant support to the country, and of its contribution to improved immunization outcomes. It informs discussions with national coordination mechanisms on areas where greater national investments and efforts, as well as technical support, are needed.

Results: Country Context

Conflict Settings

In conflict settings, health systems are fragile, and women and children suffer disproportionately. In Myanmar, it has been estimated that morbidity and mortality from indirect effects of conflict such as restricted access to clinics, poor infrastructure, and depressed economies, exceeded the burden caused by direct violence itself.¹⁰ Further, surveys consistently demonstrated that child, and maternal mortality in Myanmar internally displaced communities was higher than in general populations.¹⁰

Immunization coverage tends to be low in conflict settings. Tense security conditions, damaged health infrastructure, and depleted human resources contribute to infrequent outreach services, and delays in new vaccine introductions and immunization campaigns.¹¹ However, Naufal et al. describe a contrary scenario, where they found evidence of higher immunization coverage among children residing in high-conflict areas in Iraq than among children residing in low-conflict areas.¹² A similar pattern is described in Nigeria's Borno state where the humanitarian response following Boko Haram insurgence resulted in a sharp increase in childhood vaccination coverage. Coverage rates increased from low levels prior to the intensification of armed conflict and Boko Haram activities to levels that rivalled and, in some instances, surpassed the national averages,¹³ A study in Sierra Leone in 2017 reported higher coverage among large refugee camps than among their host community in Kenema district.¹⁴ Although over 94% of both refugee and most children under one year of age were vaccinated with Bacillus Calmette-Guerin (BCG), less than 21% of eligible host children were fully vaccinated with the remaining Expanded Program on Immunization (EPI) basic vaccines: Oral Poliovirus Vaccine (OPV), Diphtheria and Tetanus Toxoids (DTP) and measles compared to 70% of vaccinated refugee children under one year.¹⁴ These observed increases in coverage have been ascribed to the heavy presence of international aid organizations in conflict areas.

RISP Country Settings

All countries of interest within the RISP focus have intrinsic factors that disproportionally increase gender-related barriers and require careful consideration.^{15–25} Religion and religious norms influence gender roles, female mobility outside the home, and women's ability to engage with the health system independently.^{26–28} 50% of RISP countries had >85% Muslim population.¹⁷ We recognize that Muslim faith alone does not account for all gender norms within these contexts. Some characteristics influencing gender roles are local culture, completely distinct from religion; these nuances are complex.

Countries within the RISP scope have high numbers of internally displaced persons due to conflicts and natural disasters.²¹ Additionally, within RISP geographies, nurses tended to be women and doctors to be men; little disaggregated data on community healthcare workers was available for the focus areas.²² Additionally, the focus geographies are among the lowest ranking countries for gender equality index and political instability. Further detail on specific country profiles is available in Appendix 2; additional commentary and findings on religious influence and political stability are explored within the Community Results section of this report.

Results: Gender & Immunization

Individual

Individual level factors (i.e., caregiver or child characteristics) are the most studied factors related to immunization, and thus, where most interventions focus. These factors can be grouped into the following:

Characteristics of the caregiver or child

In aggregate, there appears to be no significant gender disparity with respect to routine childhood immunization in the RISP focus geographies.^{22,23} However, there are some exceptions. In India, for example, disparities exist at the national level in routine childhood immunizations: more boys are immunized instead of girls.²⁹ In other countries, it has been noted that the gender disparity is in the opposite direction, where more girls are immunized than boys.³⁰ Unfortunately, most of the data collected on this matter are at the national level, potentially obscuring sub-national trends, and masking immunization-related gender disparities that exist.

In many studies, mother's age was associated with increasing immunization rates, with younger mothers vaccinating their children more frequently than older mothers.^{28,31–33} In Pakistan, mothers aged 12-19 were 11% more likely to have their child vaccinated compared to mothers aged 32 or more.³¹ It should be noted that several studies found no association between maternal age and vaccination rates³⁴ or results pointing in the opposite direction, where younger mothers are less likely to vaccinate their child.³⁵

Maternal multiparity and birth order

Studies have found that older children and children of higher birth order (i.e., being the second, third, etc. child) had lower rates of immunization.³³

In South Sudan, mothers who had six or more children had a lower odds of being delayed compared to those whose mothers had one child.³⁶ Studies conducted in Liberia and another in Kenya showed a reduced chance of completion of vaccination for children with two to three siblings but the chance of completion increased for children with four siblings and above, when compared to one child only. However, evidence from Liberia, Nigeria, and Togo, suggest that compared to first-born children, second-born or higher birth order children had lower odds of being fully immunized.³⁶

Education and Literacy

Education and literacy play a substantial role in routine childhood immunization. It is well supported that higher maternal education leads to higher rates of childhood vaccination.^{31,37–40} One study in the Ogun State of Nigeria found completion of higher education by the mother to be the only statistically significant factor of complete immunization status for children above nine months of age.⁴¹ In Ethiopia, mothers' educational level was found to be an important predictor of full polio vaccination status in their children among pastoral and semi-pastoral regions.⁴² Studies conducted in Pakistan^{40,43,44} and

Nigeria, seem to have similar findings.^{13,35,41,45,46} Chido-Amajuoyi *et al.* observed a dose effect relationship to child never-vaccination, such that as maternal level of education increased, the odds of never-vaccination decreased.⁴⁵

Some studies found no association for mother's education and immunization rates; however, this may be attributed to education's correlation to other socioeconomic variables that may already have been accounted for.^{29,47} An ecological effect has been observed in some communities, with children of women residing in communities with a low level of illiteracy being more likely to be fully immunized compared to those residing in communities where the level of illiteracy is at the median level for the community.⁴⁶ Another study found that it was not the mother's level of education, but the father's level of education that predicted likelihood of childhood immunization.

Literacy, although related to education, but not directly the same, was also shown to be positively associated with childhood vaccinations in many countries, demonstrating that children of illiterate mothers comprised of the majority of non-vaccinated children.^{26,48–52} One study in Ethiopia found that literate mothers were three times more likely to vaccinate their children compared to illiterate mothers.⁴⁹

Attitudes, Beliefs and Knowledge

Individual understanding of vaccination, benefit to children, and knowledge of how vaccines work are all related to immunization rates.^{1,32,33,33,46,53,54} Compared to mothers who had poor knowledge of vaccination, mothers who had moderate to high knowledge of vaccination were about two times more likely to vaccinate their child.⁵⁵ In several studies, a large proportion of mothers indicated that they did not know that certain vaccinations required second or third doses.⁵⁶ Without this knowledge, a mother may be less likely to seek booster doses and have their child fully vaccinated. Similarly, many mothers who do not understand the required timing of these doses, which result in delayed or fewer complete immunizations.⁵⁶ One study found that in some communities where vaccinations are positively viewed, many mothers were unaware of which diseases could be vaccinated against.⁵⁴

Among those who choose not to vaccinate their children, some of the most cited reasons are fear of side effects, fear of injections, religious beliefs, and cultural beliefs. Fear of side effects is mentioned in nearly every study assessing vaccine hesitancy.^{33,56}

Lastly, it is shown that where mothers obtain knowledge about vaccinations has an impact on vaccination rates.^{55,57} Mothers who had any information about vaccinations were 40-200% more likely to vaccinate their child.^{32,58} Another study found that the odds of full immunization were increased for parents who watched TV at least once per week. Some studies argue that this may be another indicator of socioeconomic status, education, and literacy. However, those factors alone most likely do not explain this fully and there is an aspect of increased knowledge leading to higher vaccinations.

Access to and use of healthcare services

The relationship between mothers and their healthcare utilization and vaccination rates was explored in several studies.^{34,59} All studies considered agreed that mothers who received antenatal care (ANC) were more likely to vaccinate their children. This may be partially explained by the fact that mothers who receive ANC are more likely to be educated, literate, have higher socioeconomic status, and have a higher trust in the healthcare system.³⁴ Additionally, having more contact with health professionals

provides more opportunities for education about vaccinations. Mothers who give birth in a hospital were also more likely to vaccinate their children, likely for similar reasons as previously stated.

Women who receive prenatal care and consult with health workers before giving birth have a greater chance of choosing immunization for their babies.⁶⁰ In Indonesia, a small scope of health care services are available namely through village midwives. The village midwife program is a government effort to improve the quality of health services in the village, intended to reduce birth rates and increase public awareness of healthy living.⁶¹ The program, which has been promulgated since 2002, is considered to have succeeded in providing health counseling and referral, and in fostering effective communication patterns.

Access and Time

Ease of access, time investment, and time spacing required for vaccinations are all important factors for determining vaccine coverage. In one study, mothers cited their child was unavailable for vaccination at the appropriate time (i.e., the child was usually sick during the allotted time) as the reason for not vaccinating.⁵³ Two other studies found that among the most cited reason for non-vaccination from the caregiver's perspective was sickness in the child or other family member at the time of the vaccination.^{33,62}

Another common reason was that the caregiver was too busy and was unable to make time for the vaccination appointment.⁴⁹ This is particularly difficult when the family lives further from a healthcare setting where vaccinations would be administered.⁴⁷ While it may not be possible to easily predict when a family member might be sick, the time barrier could be reduced by increasing clinic hours to when caretakers are more available (e.g., evenings, weekends). This is of particular relevance when the caretaker is a single mother and time is limited.

Maternal empowerment

Unemployed mothers in Nigeria were more likely to have unvaccinated children when compared with their employed counterparts even after controlling for wealth.^{35,45} In this study, this positive effect of maternal employment status on childhood immunization was greatest in the northern part of Nigeria. Employment may enhance maternal autonomy, which in turn promotes maternal health seeking behaviors and child immunization uptake.³⁵ In Nigeria, the effect of female autonomy is so powerful that studies have even found a higher probability of being vaccinated among children of women whose spouse do not contribute to household earnings compared to those who earned as much as their spouses.⁴⁶ There seems to be an ecological effect of maternal employment at the community level. Women resident in communities with a high level of unemployment have been reported to have a lower likelihood of getting their children fully immunized compared to those residing within communities where unemployment was at the median level.⁴⁶

Household

Household factors provide more context about how health decisions are made and what capacity mothers are able to dictate and provide health care for their children. These factors can be grouped into the following:

Family Composition

Much has been written on household composition and its effect on childhood vaccination. As stated previously, it has been shown that children that are of higher birth rank (i.e., later than first born) are less likely to get vaccinated.^{63–65} Similarly, children in larger families are also less likely to get vaccinated, potentially attributed to having less time for each individual child or a higher probability that any one child will be sick when vaccinations are upcoming. Additionally, mothers of larger families tend to be older, as it requires time for a mother to have multiple children. As shown previously, there is a modest effect of older age in mothers resulting in a decrease in childhood vaccinations; this is particularly true in Pakistan, Ethiopia, and India.^{40,66–68} Although the research on this is sparse, there is some evidence that shows the combination of sexes of the children within a household influences their vaccinated, compared to the same situation with a male child.⁶³ A similar result was found in India in households with multiple daughters.⁶⁴

Marital Status

Marital status has been repeatedly shown to be a factor in childhood vaccinations.^{31,35,69}Households where the parents are currently married tend to have higher vaccination rates of their children.²⁸ In Pakistan, it was found that single mothers were 35% less likely to vaccinate their children compared to married couples; a similar relationship was found in India.⁵⁰

Decision-Making Power and Autonomy

Although households with married parents have higher vaccination rates, this was not the case in households where mothers have poor decision-making power.^{54,62,70–74} In the literature autonomy is measured by a few means. One commonly cited measure is attitudes towards wife beating. Women who believed that wife beating was not justified tended to vaccinate their children more often.^{7,74,75} One study showed that in Nigeria, having one positive relationship between a measure for women's agency showed an increase in child immunization.⁶² The authors of this study go on to say that the measure of women's agency with the strongest effect on immunization was a mother's decision-making power. In Nigeria, women with high household decision-making are more likely to have their child fully immunized than women with low decision-making power.^{35,76} As mothers tend to provide most of the care for younger children, as decision-making power increases, mothers can make better, healthier decisions for their children.

Generally, as mother's decision-making power increases, there tends to be an increase in vaccination. There have been several studies that if both mothers and fathers share in decision making, particularly in child healthcare, childhood vaccinations increase as well.^{54,62} Having another parent be available

when the other is sick or otherwise unable to attend the clinic for vaccinations may partially account for this.

Father's Education

In many contexts, the mother oversees the healthcare of their children. As the father may not be the caretaker involved with a child's immunization, father's education is considered a household factor. In Pakistan, studies have found that father's education is positively associated with the decision to immunize.^{44,77} Evidence from data collected in 2006 from nine districts in Punjab and Khyber Pakhtunkhwa suggest that although only mother's education is positively associated with children's height and weight, father's health knowledge acquired through education matter for health-seeking behavior and immunization status of the child.⁷⁸

Community

Community level factors provide cultural context and focus on the influence community gender norms. These factors can be grouped into the following:

Preference for Male Children

In some countries, compared with male children, female children are less likely to have access to immunization services.⁴⁷ There have been reports of girl children being neglected in Pakistan and being less likely to be immunized by virtue of their gender,^{77,79} further exemplified by the following quote: "[*The vaccinator*] observed a case of twins; one was a female and other a male child. The female child wasn't given much importance, as she was not breast fed by her mother and she was not vaccinated".⁴³

The custom of patrilocal residence in much of the region that leads to mainly sons supporting parents in old age may cause parents to care more for the future earnings of sons.⁷⁷ It is postulated that gender discrimination lies not in parental preference for boys, but in higher returns to parents from investment in boys that results from the custom of patrilocal residence for instance.⁷⁷ However, some studies have not found this preferential treatment for male children.⁸⁰

Some studies demonstrate important gender-related differences in coverage between boys and girls in India.^{28,55} One report found that for children born in 1989, 1991, and 1996, girls are less likely to access immunization services and have lower coverage rates of BCG, OPV, DPT.^{81,82} Although these significant gender inequities seem not to have persisted for children born in older years, the gender inequities in access to preventive care in India noted here are likely to reflect, at least in part, the societal preference for sons in India.^{83,84} This practice seems to be particularly favored by those with low levels of maternal education.⁸⁰

Political Instability and Insecurity

Political instability is associated with lower and less equitable levels of DTP3- and measles-containing vaccination coverage. During conflicts, population displacements and security concerns may affect

both demand and supply aspects of vaccination efforts.⁶⁵ In Pakistan, *Leone et al.* report that intensity of conflict is negatively associated with vaccination, with boys significantly more likely to be vaccinated than girls.⁸⁵

In Pakistan, there have been incidents of harassment, target killing, security threats and kidnapping of the health workforce, specifically those working within the polio program.⁴³ Female CHW are more likely to work in isolation in remote areas, with a risk of being targeted during preventive visits or vaccination campaigns. Additionally, attacks against female CHW receive less attention and are reported less frequently.³⁹ These have led to the non-availability of health professionals of all cadres, particularly with female health workers, further discouraging the community from seeking healthcare.⁴³ In South Sudan, studies have shown that women living outside of the United Nations' (UN) protection of civilians (POC) sites who travel to the camp for health services, are at risk of rape and violence.⁸⁶ In Iraq, one study of healthcare in Mosul under ISIS occupation noted that women were at risk of being forced to marry and were not allowed to travel or relocate. This practice affected female health workers in particular.⁸⁷

In Afghanistan, women who ventured out onto the streets for any reason, including to seek medical care were frequently attacked by Taliban guards and warned not to appear on the streets again. Female healthcare providers who worked in areas under Taliban control were exposed to brutal treatment on an almost daily basis. Many female doctors and nurses are beaten or forced to witness beatings of female colleagues by Taliban guards.⁸⁸ These armed guards can constantly be found in hospitals and are able to intervene at their discretion as part of the Department for Enforcement of Morals. There are stories of nurses being beaten for not wearing burgas (head-to-toe coverings).⁸⁸

In Nigeria's Borno state, safety for female service providers remains a challenge with the Boko Haram insurgence, leading to shortage of human resources for many MNCH programs.^{13,14} Despite numerous publications describing challenges faced by healthcare providers in conflict settings, some note that very few explicitly mentioned sexual violence as a form of attack that health workers may face.³⁸ "It is very difficult to collect reliable data on sexual violence against health workers" because of stigma, and further violence from perpetrators, relatives and colleagues.³⁸

The Role of In-Laws

In India, resistance from mothers-in-law make daughters-in-law hesitant to accept vaccination, some mothers-in-law not seeing the need for vaccination as they did not take their own children.⁸⁹ Similar findings have been reported in Pakistan, restricting women from travelling or leaving her house alone or visiting a healthcare facility; women are typically restricted by men or by their mother-in-law.^{89,90} Additionally in Pakistan, living in extended or joint families also influences health-seeking behavior. It is hypothesized that customarily in joint families the in-laws or the elders make most decisions in the household and feel responsible for carrying out day-to-day chores. Interestingly, among immunized children, girls are less likely to be immunized in a nuclear set-up than in a joint family setting, implying a relatively higher value of sons in nuclear living set-ups.⁴⁰

In some parts of Nigeria, women report playing strong roles in decisions on immunization of their children even though the men are the primary decision makers. However, there are numerous influences outside the nuclear family that direct immunization decisions: men are strongly influenced by their mothers, while women valued the direction of their fathers/fathers-in-law.⁴¹ In fact, young women in some settings resort first to the elders (older men) in the communities for answers to their immunization questions who then would point them to the health workers.⁴¹

Religion and Religious Decrees

In general, complete vaccination coverage tends to be lower among mothers in Muslim communities.⁹¹ *Akseer et al.* describe the status and drivers of maternal, newborn, child and adolescent health in the Islamic world.²⁶ They found that Muslim majority nations globally have higher mortality among vulnerable populations relative to non-Muslim countries, and coverage of essential interventions, especially those around reproductive health, prenatal, delivery and labor, and childhood vaccines, are significantly lower.²⁶

In Pakistan, the Taliban used a combination of fatwas (religious decrees), threats, and physical assaults to disrupt maternal and child health services. Three fatwas were instituted that had serious implications for the role of lady health workers (LHW) in the community.³⁹ The first declared that the presence of women in public spaces was a form of public indecency, which affected their ability to travel unaccompanied—a key requirement of their job.⁵⁵ This fatwa also stated that it was a Muslim man's duty to kidnap LHWs when they paid home visits, to marry them forcibly (even if they were married women), or to use them as sexual slaves. Maulana Fazlullah, the Taliban chief of the Swat district, even went as far as declaring the LHWs wajibul qatal, meaning that it was acceptable to kill them.³⁹ The second fatwa declared that it was morally illegal for Muslim women to work for wages. The third fatwa declared that LHWs were men because they travelled unaccompanied in the streets like men. Like all non-family men, they should not be allowed to enter homes. Since a key aspect of the LHWs' work is home visiting and doorstep health services, this fatwa essentially made it impossible for them to work.³⁹

The Taliban used radio to turn the population against the LHWs in Pakistan.^{39,88} A daily radio program was dedicated to discrediting the primary care program and the women who worked in it. Individual LHWs were named and shamed as prostitutes and "servants of America". CHWs report instances of verbal harassment and beatings during home visits.^{39,88} The LHW's program mandate to provide family planning services made it an ideological target as the Taliban was hostile to the concept of family planning. They also believe that contraceptives promote vulgarity, obscenity, and extramarital sexual relations.^{39,88}

In predominantly Muslim settings, anti-vaccination propaganda circulating in the community plays a role in maternal decision making for immunization, especially regarding the halal status of the vaccine.⁶⁰ A mother who lives in a culture of high collectivism tends to make decisions based on consideration and approval from her immediate environment. If information or rumors develop in a group that the vaccine contains substances that are not halal, then this will be used as information in the group decision making. Moreover, if the information is trusted by the head of religion or customary leader, group members tend to follow it.⁶⁰

In Ethiopia, Mothers' religion was found to be an important predictor of full polio vaccination status in their children among pastoral and semi-pastoral regions. Children of Muslim mothers were less likely to be vaccinated against polio.⁴² This has also been reported in Nigeria,³⁵ especially in the northern parts, where the odds of never-vaccination are increased in children belonging to Muslim households.⁴⁵

Adolescent Marriages and Pregnancies

In settings where girls get married at a young age, adolescent pregnancies follow. In Pakistan, women tend to marry early and as such, the ratio of young mothers is very high.⁷⁹ In Bangladesh, it is estimated

that 66% of women under the age of 18, especially in the northern region, report having their first birth.⁹² These mothers often have minimal school attainment and lack self-confidence.⁹³ They less often seek care from health facilities as well as have their babies immunized in a timely fashion.⁹⁴ As a result, vaccination coverage has been seen to be lower among children born to adolescent mothers in Bangladesh. Secondary data analysis of datasets (2004–2014) from Bangladesh Demographic and Health Surveys (DHS) found that measles vaccination coverage among children of adolescent mothers ranged from 21% to 20% over the study periods, lower than coverage among older mothers.⁹³ In Nigeria, increasing maternal age has been found to confer protection against never-vaccination, with mothers in the age group 16-25 years having the lowest odds of immunization.⁴⁵

Female Mobility

Gender rules that restrict female mobility limit access to care.⁵⁰ In Afghanistan, women in some areas are not allowed to move around without a male family member or mahram (i.e., for those who do not have living male relatives).⁸⁸ Seclusion laws further make commuting for healthcare services difficult. Segregated bus services introduced to prevent males and females travelling on the same bus under the Taliban rule made commuting for both healthcare providers and seekers even harder.⁸⁸

In parts of Nigeria (Ipara and Ilara), some traditional festivals such as the Oro festival, have been found to negatively affect immunization programs. During these events, women are unable to seek immunization services due to traditional rituals and imposed curfews.⁴¹

Similarly in Pakistan, cultural norms and practices affect the accessibility of healthcare for women and children. These norms restrict women from travelling or leaving her house alone; women are typically restricted to visiting a healthcare facility for ANC or PNC by family.⁴³ In general, there seems to be a positive relationship between women's freedom of movement and immunization.⁹⁵

Rurality

Immunization levels seem to be weakest for female children in urban slums⁹¹ and rural areas, with overwhelming evidence from India.^{55,64,83} Pande *et al.* described a scenario where in rural Punjab almost twice as many girls than boys are completely un-immunized. Possible explanations to this are weaker immunization systems in rural areas and poor demand for vaccines due to lack of health education among these populations.³⁷ Issues with transportation for rural populations may pose a substantial barrier, with some citing missing transport as their reason for not vaccinating. Similar findings have been reported in Tanzania and Pakistan.^{31,95}

Distance between health facilities and communities has been shown to influence women's decision to immunize their children, as mothers who are often the primary caregivers have to travel long distances to seek care.^{31,26} For example, in India's Udaipur district in Rajasthan, complete vaccination rate was 55% for households <1 km away, 47% for distances 1-2 km, 32% for distance 2-7km; and 30% for >7 km from health centers.⁹¹

Social Stratification and Status

Caste is a hereditary designation, in which the social code that an individual is expected to follow is determined at birth. In India, the caste system was traditionally divided into four hierarchal categories, with other additional groups of social and educationally disadvantaged people in an additional social stratum.^{65,91} The caste system was officially abolished in 1950, and despite protective legislation to

discourage caste discrimination, the legacy of the caste system in India endures, particularly in rural areas.³⁹ Infants born to mothers from "lower" caste tend to have lower vaccination coverage.^{91,96} The relationship between caste and vaccination status seems to be mediated by access to and availability of health care, and attitudes toward vaccination.⁹⁷ Caste systems with varying levels of rigidity are found in multiple geographies of interest (Niger, Chad, Somalia), however, the relationship between caste system and vaccination in these contexts is not well documented.

Health System

Health System level factors focus on ways in which gender influences the health system, from both a provider and patient experience. These factors can be grouped into the following:

Female Health Worker Shortage

In Afghanistan, there is a relative lack of women with higher education as a result of conflict and gender segregation policies that had prohibited women from receiving education beyond primary school under the Taliban regime.^{88,98,99} This resulted in a huge shortage of female healthcare providers,¹⁰⁰ with 40% of the country's health facilities having no female health professional on site.⁹⁸ Because women were neither able to be treated by men nor in the same medical facilities as their male counterparts, many lacked access to care.⁹⁸ In 2002, Afghanistan's Ministry of Public Health and its development partners initiated a new paradigm for the health sector by electing to Contract-Out the Basic Package of Health Services (BPHS) to non-state providers as part of its national strategy to increase access to basic health services.⁵⁶ Finding women to fill key field positions, especially those in hardship posts proved particularly challenging. In order to fill the gaps in human resources, non-state providers would hire staff from neighboring countries such as Tajikistan and Uzbekistan, as they shared the same language and culture and these workers were provided attractive salary packages, accommodation and transport.^{56,98,99} In some cases, the hiring packages for female health workers included also hiring their husbands, at least in the case of female doctors. The employment of such innovative strategies during contracting-out was associated not only with an overall increase in service use but also with an increase in use by the poor, female patients, and children under-5.¹⁰¹

Female Health Worker Attrition

In Afghanistan, after the Taliban regime, efforts were made to increase the number of female healthcare providers. The number of female community health workers rose from 729 in 2004 to 14016 in 2017 as a result of the multisectoral interventions implemented under BPHS.¹⁰⁰ However, there is a high attrition rate of female health professionals.¹⁰¹ The permission of the male head of the family for a female to become a community health worker (CHW) is necessary, and there have been many cases where single female CHWs stopped working after they got married.¹⁰²

Women in Senior Positions

In Afghanistan, although female CHWs tend to accomplish their roles as health providers better than their male counterparts, very few women are found in supervisory, managerial or policy making positions due to cultural practices.¹⁰² For example, community health supervisors require extensive

travel between villages, something with which most Afghan women are not socially comfortable, and which is difficult for women to negotiate. Apart from gender differences embedded in the culture, this can also be explained by lower female secondary education in Afghanistan.¹⁰²

Segregation, Recruitment, and Job Tasks

In Afghanistan, although the content of the training of community health workers is similar for both male and female CHWs, the gender of CHW trainers depends on the attitude of the population.¹⁰³ In central Bamyan, there is one male trainer for both male and female CHWs; however, in Kabul, Balkh and Parwan, female CHWs have female trainers and male CHWs have male trainers.¹⁰² During the recruitment phase, it is preferred that male and female CHWs recruited in a health post be Mahram (relatives of opposite gender allowed by Islamic law to interact). Women in some states such as Bamyan actively participate in the running of the health care system. Women are allowed to provide some health services, and it is normal for female and male health workers to work together. In other parts of the country, such as Nooristan, this would not be considered culturally acceptable, requiring a different health system structure.⁵⁶

Gender Inequality Within the Health System

Health sector reforms in post-conflict contexts have also failed to consider gender while developing and implementing recruitment, retention, and career advancement strategies.¹⁰⁴ Studies of the Afghanistan experience show that while improving health indicators for women, the Basic Package of Health Services (BPHS) did not sufficiently reflect on if and how to promote gender equity within the health system.¹⁰² Female health workers and the provision of primary health care services was a tool to reduce maternal mortality – not part of the effort to build a gender equitable health system or promote gender equity. Women have been largely absent during human resource planning processes, due to their lack of representation at higher decision-making levels.¹⁰⁴

Integration of MNCH Health Services

In Nigeria, the *presence of antenatal and delivery services in the health centers* played a key role in driving immunization utilization.⁴¹ This was seen clearly in Ilara where FGD respondents reported that the absence of delivery facilities discouraged women of all tribal groups from using immunization services at the facility. In Ipara, delivery services at the health facility promoted the use of health and immunization services.⁴¹

Poor Services from Vaccinators

In Pakistan, there have been complaints about poor services from lady health workers.³ Some are described as being in a hurry to get the task done, and not interested in spending time educating the parents especially on side-effects and possible adverse reactions.¹⁰⁵ The experience in one study was quoted as: "*Baji (LHW) is always in hurry, as soon as she enters our house; she just fills the card, vaccinates the child abruptly and leaves immediately without telling us anything about managing the side effects of the vaccine or next visit".¹⁰⁵*

Maternal Antenatal Care

Maternal ANC and tetanus toxoid (TT) vaccination has been shown to be positively associated with childhood immunization. In Ethiopia, mothers/caregivers who took any TT vaccine during pregnancy were 2.43 times more likely to fully vaccinate their children than mothers/caregivers who took none.⁴⁹

Similarly, in Bangladesh, mothers/caregivers who did not receive TT vaccination during pregnancy were 70% less likely to have their children fully immunized than those who received it.¹⁰⁶

Place of Delivery

Home deliveries have been associated with an increased likelihood of incomplete vaccination. In Pakistan, women who deliver at home are 39% times more likely to have children with incomplete immunization.³² Similar findings have been reported in Ethiopia where children born in health institutions were 2.02 times more likely to be vaccinated completely than those born at home.⁵⁰ Possible explanations include the fact that mothers who have home deliveries may have weaker or no acquaintance with health-care staff and hence are less aware of the importance of the timely completion of vaccination.³² Household visits for postnatal care have been shown to contribute to higher rates of immunization within this context.

Gender Appropriate Interventions

In Pakistan, armed conflict in several districts of the Khyber Pakhtunkhwa province and the Federally Administered Tribal Areas (FATA) resulted in over 2.7 million IDPs.¹⁰⁷ Health promotion activities among displaced mothers were a contributor to the protection of the right to health of mothers and children. Mothers were reminded of their role in disease prevention by inculcating healthier attitudes and behaviors including immunization. The bangle initiative emerged as a socially valued incentive, as colorful bangles in Pakistan's cultural context signify happiness and hope. The implementation of this health promotion initiative by culturally sensitive female health workers generated wider acceptance among displaced mothers and approval from their male family members.¹⁰⁷

Policy and Governance

Policy and Governance level factors focus on ways in which governing laws influence lived experience across genders. These factors can be grouped into the following:

CHW Program Integration

CHW programs are an important part of improving health outcomes and delivering culturally competent, people-centered health care in resource-limited settings. CHW programs utilize paid and volunteer health workers and require less training than nurses or doctors.^{102,108} The effectiveness of community-based interventions is well documented, but these programs require health policy guidance and supportive supervision to reach their full potential.¹⁰⁹

While utilization of CHWs may have a positive impact on community health care, but in the absence supportive supervision and policies, these programs are not as effective.¹⁰⁹ CHWs need clear guidance on roles and responsibilities, as well as a limits on their workload and daily tasks. This necessary support may come in the form of required training, competent supervision, regular provision of logistical support and supplies, and required financial compensation.^{109,110} CHWs also require inclusion in policy to safeguard labor rights and the inclusion in national human resource strategy for

health care planning, governance, legal rights, and financing. Lastly, CHWs are proven to be more successful when integrated into the health system through the ministry of health, NGOs, and international donors. By incorporating CHWs in the strategy for all of these sources of financial support, CHW programs appear more legitimate to the community and are protected from political instability and fluctuations of monetary support.^{5,109}

In contrast, the government in Afghanistan through various ministries, developed policies and programs to address gender inequalities after taking over from the Taliban regime.¹¹¹ Table 1, adapted from Samar and colleagues, highlights nine different strategies described aimed at reducing inequities in health, with potential to improve indicators within the national immunization program.¹¹¹

Within Afghanistan, it is shown that female CHWs have the highest chance of being able to enter households to identify children and to educate caregivers in decision making around vaccinating all their children.¹¹² Some argue that contrary to some programs, the Polio Eradication Initiative (PEI), has demonstrated that the structure of their Community Based Health Care (CBHC) programs do not benefit women workers financially, nor do they contribute to women's influence over decision-making.⁵³ It is argued that this program, while well-meaning, is evidence that the impact of interventions by gender must be considered beyond just coverage numbers and that regulations and protections for female workers is essential.⁵³

Health Financing

Amongst Gavi-supported countries, overall greater government expenditures and greater external resources for health were associated with lower inequalities in coverage.³⁰ Higher individual out-of-pocket health expenditures were associated with increased inequalities. Recommendations for free of charge vaccines for beneficiaries in theory remove financial barriers for children in lower income households. However, simply removing payment for health services have not always had the intended results. In some settings, vaccines continue to be at cost for the recipient through unofficial charging for services,^{113,114} and in other settings, like Burkina Faso, cost exemption alone was not associated with increased utilization of health services.¹¹⁵ These findings indicate that while financial barriers of vaccines are important, more needs to be addressed by the government or outside donors in order to reduce coverage gaps like subsidies for transport, convenient location of services, or restructuring of financing for other services like maternal health care.^{115,116}

Women in Leadership Positions

In the case of stakeholder engagement, women in highly trained or decision-making positions in the health system are severely underrepresented. For example, in an assessment of the health workforce, it was found that overall, 75% of health workers were women, but comprised just 21% of medical doctors and 28% of clinical officers. Adequate representation of women in higher trained positions is essential to ensure decisions are made with women in mind and to better serve patients who may have a provider gender preference.¹¹⁷ Furthermore, it is shown that lack of female representation at the policy and decision-making level fails to address gender biases, downplays female perspective in health, and fails to draw attention to women's needs.⁸

Demonstrated Benefit

Evidence has shown that childhood immunization campaigns benefit from strategies aimed at reducing gender inequities like improvement of women's literacy, paid employment, and decision-making autonomy.⁵ Though policies and programs may address gender-specific issues, improvements made to benefit women, like strengthening of education quality and access, benefit both men and women.^{5,118} Additionally, paid maternal and paternal leave policies are associated with increased equality in decision making and improved health outcomes,¹¹⁸ supporting the notion that gender-integrated approaches benefit the quality of services and outcomes for all.

Conclusion

Key Findings

Although existing data shows little to no significant relationship between gender and routine immunization coverage at a national level, gender-barriers to routine immunization go far beyond coverage. Using the ecological framework, gender-related factors influencing routine immunization were identified at the Individual, Household, Community, Health Services, and Policy level. Important Individual factors with known associations to vaccine coverage include mother's educational attainment, prenatal access to care, mother's empowerment, and family size. Household factors associated with vaccine coverage include marital status, father's education, and household decision-making dynamics. At a community level, cultural norms, religion, rules around women's mobility, and rurality all influence routine immunization coverage. In the Health System, representation, and compensation of women in health care positions, respect given to female patients, and maternal utilization of antenatal health services influence childhood vaccination coverage. Lastly, at a macro level, policies have the potential for great impact; representing women in areas of decision making, strategic consideration of health financing, and ensuring beneficial policies for all have demonstrated association with increased vaccine coverage.

Integrating gender into policy and the health system are touted as having the most potential for impact, but many studies addressing gender and routine immunization activities focus on characteristics at the individual, household, or community level. Although measuring the impact distinct factors have on routine immunization is a challenge, the first step to creating meaningful change is collecting granular gender disaggregated data. Furthermore, accountability measures through national policy and leadership are crucial to integrating gender equity into health systems.

Recommendations

Through a landscape review of routine immunization and gender using the existing literature and expert interviews, the following are identified as distinct recommendations and best practices:

COLLECT GENDER-DISAGGREGATED DATA

In order to understand the full extent of gender differences in routine immunization activities, gender disaggregated data must be collected at local and national levels. Necessary data is not limited to accurate quantitative vaccination coverage estimates, but also encompasses measures of female autonomy and decision making, disaggregated data on health care workers and community leaders. To further understand dynamics at play beyond coverage estimates, qualitative factors of influence must also be collected. Policy and funding must require written consideration of gender impacts, strategy to address identified barriers, measurement of relevant indicators, and follow up at regular intervals to track impact over time.

TARGET INTERVENTIONS AT THE HEALTH SYSTEM LEVEL

Locations where vaccination services are provided must expand to offer additional health services to better serve communities and improve likelihood of access. Opportunities for vaccination must be in convenient locations for women and their children, and interventions should pay particular attention to the size of the family when considering how one might engage families in vaccinating their children, ensuring larger families are captured. Programming must also expand availability of female health workers should there be cultural restrictions on patients and providers of opposite sex. Shifting patient interactions to address women directly and to allow them to make well informed decisions about their medical care empowers women and provides an opportunity for a gender-transformative intervention.

INTEGRATE COMMUNITY HEALTH WORKERS IN THE HEALTH SYSTEM

Community health workers are an integral component of the health system. Policies are needed to protect female CHW working conditions, must compensate female CHWs adequately for their labor and provide room for advancement and leadership. Integrating CHW programs into budgeting and planning in Ministry of Health strategy increases legitimacy of CHWs in public opinion and provides additional protections for these programs.

IDENTIFY AREAS FOR SUBTLE CULTURAL SHIFTS

Change takes time, particularly when it comes to cultural gender norms. In places with large gender inequities and low women's empowerment, sweeping policy changes may not be successful. In these contexts, it is beneficial to consider how to subtly shift the culture. Although many interventions focus on the mother's role or on increasing a mother's decision-making power, considering how to involve fathers in healthcare decision making will may improve household cohesiveness and result in an overall increase in vaccination rates. One opportunity is to include both men and women in childbirth and child health education classes helps to engage both parents in childcare responsibilities.

Appendices

Appendix 1 – Tables and Figures

FIGURE 1: ROUTINE IMMUNIZATION AND GENDER ECOLOGICAL FRAMEWORK⁶



TABLE 1: POLICY EXEMPLARS FOCUSED ON GENDER IN AFGHANISTAN ^{15–25}			
Policy	ISSUES ADDRESSED	STRENGTHS	Notes
National Reproductive Health Strategy Revised in 2006 and 2012 (MoPH 2003, 2006)	Reduce maternal and infant mortality based on millennium development goals	Strong emphasis on increasing number of female health providers; human rights-based approach in RH focus on women, vulnerable and marginalized groups	In 2006, revised policy addressed the weakness of basic package of health services and incorporated it
National Health Policy and Strategy (MoPH 2005)	Better health for all Afghans to contribute to economic and social development	18 strategies, prioritizing strengthening female health workforces and delivery of safe motherhood, FP services	Less emphasis on gender equality and health rights
NAPWA	Women's holistic well-being, addressing gender issues in Afghanistan, and reducing poverty	Beside addressing gender issues in various sector, emphasize health and developing female health workforce	Lack of investment plan (budget plan) for action points and M&E plan
ANDS (Government of the Islamic Republic of Afghanistan 2008)	Comprehensive development strategy in all the sectors including health	Reproductive health and child health/human resources in health	Less gender-oriented in health sector
National Health and Nutrition Strategy	Improving nutritional status to reduce maternal and child mortality	Various nutrition strategies described	Weak emphasis on gender sensitive M&E system; little gender disaggregation mentioned
National Child and Adolescent Health Strategy	Integrated package of all priority strategic interventions for child survival, adolescent health, establishment of the national/ provincial maternal and child health committees	Early marriage of girls and adolescent pregnancies addressed as causes of high maternal and infant mortality/emphasis on community-based health care	Roles of different institutions of MoPH defined but less emphasis on gender and establishment of different committees

Ministry of Women's Affairs' National Priority Programme	Addressing gender issues and focus on gender training of government staff	Gender training of MoPH staff	Time and follow-up mechanisms not described
National Gender Strategy 2011–2015	Focus on reproductive and child health, disability, mental health, and gender- based violence	Review of policies and strategies on gender and health and strategy as guiding principles for Gender Department in MoPH	Similar content to National Health and Human Rights Strategy
National Health and Human Rights Strategy	Health equity as human rights, reproductive and child health, disability, mental health, and gender- based violence	Review Emergency and humanitarian crises, access to quality medication addressed; disaggregated gender- sensitive indicators for M&E	Similar content to National Gender Strategy

Appendix 2 - Country Profiles

Country Profile: Afghanistan

SOCIO-DEMOGRAPHIC DAT ¹⁵⁻²⁵		
Population	Total (38,928,000), sex ratio (105.4 males per 100 females)	
Religion	99.7% Muslim (Sunni 84.7 - 89.7%, Shia 10 - 15%), other 0.3%)	
Literacy rate	>15 years (2018): 29.8% for females and 55.5% for males	
	15-24 years (2018): 56.2% for females and 74.1% for males	
Gender inequality index	Ranking (2019): 157/162; Up from 0.745(2005) to 0.655(2019)	
Political stability	Estimate: -2.65, percentile rank 0.95/100	
Internally displaced persons	3,547,000 due to conflict and 1,117,000 due to disasters	
	IMMUNIZATION-SPECIFIC INDICATORS	
DTP3 coverage	Increased from 4% (1980) to 66% (2019)	
Coverage by gender	No evidence of significant differences in coverage between boys and girls at national level	

COUNTRY NOTES

Around one third of vaccinators (n=1,275/3926) are females. Majority of female vaccinators work in urban and secure areas.

Taliban regime (1996-2001): Women were barred from employment and education, forced to wear the burga and forbidden from leaving home without a male "guardian" or mahram. Also, local traditions (Pashtun people) involve the seclusion of women (purdah) and rigid codes of family honor.

Children of mothers with no education have lowest levels of immunization coverage while the children of mothers with primary education or more, have higher immunization coverage.

GAVI JOINT APPRAISAL REPORT 2019: GENDER-RELATED BARRIERS TO IMMUNIZATION

No significant gender related barriers for infants to be vaccinated, but there are barriers preventing the mother and female caregiver of children to go to immunization post alone or to make decision about children vaccination. Additionally, the services are accessed and utilized equally by the parents and caregivers of boys and girls.

Country Profile: Pakistan

SOCIO-DEMOGRAPHIC DATA ¹⁵⁻²⁵		
Population	Total (220,892,000), sex ratio (106 males per 100 females)	
Religion	96% Muslim, 4% Ahmadi Muslims (whom Pakistani law does not recognize as Muslim), Hindus, Christians, Parsis/Zoroastrians, Baha'is, Sikhs, Buddhists, Kalash, Kihals, and Jains	
Literacy rate	>15 years (2017): 46.5% for females and 71.1% for males	
	15-24 years (2017): 67.5% for females and 81.3% for males	
Gender inequality index	Ranking (2019): 135/162	
Political stability	Estimate: -2.25, percentile rank 3.33/100	
Internally displaced persons	104,000 due to conflict and 806,000 due to disasters	
	IMMUNIZATION-SPECIFIC INDICATORS	
DTP3 Coverage	increased from 2% (1980) to 75% (2019)	
Coverage by gender	No evidence of significant difference in coverage between boys and girls at national level	

COUNTRY NOTES

"Lady Health Workers Programme" (LHWP) was launched in 1994. One LHW is responsible for 1000 people, or 150 homes (5 to 7 houses daily). Work for one LHW includes over 20 tasks, including immunization services.

GAVI JOINT APPRAISAL REPORT 2019: GENDER-RELATED BARRIERS TO IMMUNIZATION

Mothers are typically the primary caregivers for their children, but their capacity to act on their own and their child's behalf is limited.

Lack of health literacy leads to limited understanding of immunization. Vaccination coverage increases with education from 61% for uneducated mothers to 99% among educated mothers.

Gender of the vaccinators is considered as a major barrier to vaccination in many districts. Traditionally, community women do not speak to male vaccinators. In areas where LHWs are not appointed, there is a major problem of low coverage.

Country Profile: DRC

	SOCIO-DEMOGRAPHIC DATA ^{15–25}
Population	Total (89,561,000), sex ratio (99.7 males per 100 females)
Religion	1.5% Muslim, 95.8% Christian (48.1% Protestant and 47.3% Catholic), 1.8% No religious affiliate)
Literacy rate	>15 years (2017): 66.5% for females and 88.5% for males
	15-24 years (2016): 79.7% for females and 91% for males
Gender inequality index	Ranking (2020): 150/162
Political stability	Estimate: -1.81, percentile rank 5.71/100
Internally displaced persons	5,268,000 due to conflict and 64,000 due to disasters
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage increased from 18% (1980) to 57%(2016) and has plateaued since then
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level

COUNTRY NOTES

Political and institutional instability and insecurity: massive movements of the population in Kasai and Kwanto; internal refugees in Kivu; the Kasaïs and Tanganyika following insecurity and armed tribal and ethnic conflicts have had a major impact on the implementation of activities, resulting in a drop in immunization coverage levels.

Period of 30 September to 25 October 2018: A freeze was placed on Gavi funding due to a 2017 audit report not having been filed as of 30 June 2018, in accordance with the Partnership Framework Agreement signed between Gavi and the MoH. This situation caused an interruption of activities, resulting in targeted children in the provinces not being immunized leading to disease outbreaks.

On 11 October 2018, the country officially launched implementation of the Emergency Plan to resume routine immunization, known as the Mashako Plan, in nine provinces that accounted for around half of all children in the country who have not been sufficiently immunized.

GAVI JOINT APPRAISAL REPORT 2018: GENDER RELATED BARRIERS TO IMMUNIZATION

None reported

Country Profile: Niger

	SOCIO-DEMOGRAPHIC DATA ¹⁵⁻²⁵
Population	Total (24,207,000), sex ratio (101.1 males per 100 females)
Religion	98% Muslim (majority being Sunni); 2% Christians
Literacy rate	>15 years (2018): 26.7% for females and 43.6% for males
	15-24 years (2016): 35.6% for females and 51.1% for males
Gender inequality index	Ranking (2020): 154/162
Political stability	Estimate: -1.40, percentile rank 9.5/100
Internally displaced persons	257,000 due to conflict and 267,000 due to disasters
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage increased from 6% (1980) to 81%(2019)
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level though coverage tends to be higher among females
Health care workers	Doctors tend to be men and nurses to be women

Country Profile: Chad

	SOCIO-DEMOGRAPHIC DATA ¹⁵⁻²⁵
Population	Total (16,426,000), sex ratio (99.7 males per 100 females)
Religion	52% Muslim, 24% Protestant, 20% Catholic, 0.3% animist, 0.2 % other Christian, 2.8% no religion, and 0.7% unspecified
Literacy rate	>15 years (2016): 14% for females and 31.3% for males
	15-24 years (2016): 22.4% for females and 40.7% for males
Gender inequality index	Ranking (2020): 160/162
Political stability	Estimate: -1.34, percentile rank 10.48/100
Internally displaced persons	342,000 due to conflict and 680 due to disasters
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage increased from 1% (1983) to 50% (2019)
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level
Health care workers	Nurses tend to be males

COUNTRY NOTES

Only 22% of children are completely immunized. Low immunization coverage rates are observed in most provinces, including the capital.

Gender, birth rank, maternal education and economic wellbeing create disparities in coverage.

27% immunization coverage among children whose caregivers are out of school and 61% among those whose caregivers have secondary education

Populations with difficult access to immunization services include islanders, flood-prone areas, deserts, and special populations (nomads, refugees, returnees, and displaced persons).

Surveys conducted in recent years do not identify a barrier related to gender inequality. To facilitate access, health centre managers agree with the community on immunization schedules and days.

Country Profile: CAR

	SOCIO-DEMOGRAPHIC DATA ^{15–25}
Population	Total (4,830,000), sex ratio (98.3 males per 100 females)
Religion	50% Christian, 35 % indigenous religions, and 15 % Muslim
Literacy rate	>15 years (2016): 25.8% for females and 49.5% for males 15-24 years (2016): 28.7% for females and 47.8% for males
Gender inequality index	Ranking (2020): 159/162
Political stability	Estimate: -2.18, percentile rank 3.81/100
Internally displaced persons	682,000 due to conflict and 4200 due to disasters
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage decreased from 13% (1980) to 47% (2019)
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level

COUNTRY NOTES

The predominantly Christian anti-Balaka and the predominantly Muslim ex-Seleka militia forces continue to occupy territories in the western and northern parts of the country, respectively, and sectarian clashes between them and Christian and Muslim populations continue.

The Muslim community have stated that there is continued discrimination by government officials on account of their religious beliefs or affiliation, including exclusion from public services, such as access to education and healthcare

The highest number of unvaccinated children remain in the districts of the city of Bangui (Bangui II and Bangui III) and this bears witness to the poor accessibility of immunization services (low geographical coverage, inappropriate delivery days and times).

Country Profile: Guinea

	SOCIO-DEMOGRAPHIC DATA ¹⁵⁻²⁵
Population	Total (13,133,000), sex ratio (93.7 males per 100 females)
Religion	85 % Muslim, 8% Christian, and 7% adhere to indigenous religious beliefs
Literacy rate	>15 years (2016): 22% for females and 43.6% for males 15-24 years (2016): 37.2% for females and 57% for males
Gender inequality index	Ranking (2020): No ranking available
Political stability	Estimate: -0.83, percentile rank 17.62/100
Internally displaced persons	No data for displacement due to conflict and 2600 due to disasters
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage decreased from 15% (1982) to 47% (2019)
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level

COUNTRY NOTES

Major discrepancies in immunization data with national coverage consistently reporting almost 100% coverage while other sources like WUENIC report less than 50% coverage.

DTP3 Coverage is highest among the more educated mothers and lowest among the least educated mothers.

Country Profile: South Sudan

	Socio-demographic data ¹⁵⁻²⁵
Population	Total (11,194,000), sex ratio (100.2 males per 100 females)
Religion	60% Christians, 33% indigenous (animist) religions, 6% Muslims
Literacy rate	>15 years (2016): 28.9% for females and 40.3% for males 15-24 years (2016): 47.4% for females and 48.4% for males
Gender inequality index	Ranking (2020): No ranking available
Political stability	Estimate: -2.56, percentile rank 2.38/100
Internally displaced persons	1,436,000 due to conflict and 106,000 due to disasters
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage decreased from 61% (2011) to 49% (2019)
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level

GAVI JOINT APPRAISAL REPORT 2019: GENDER RELATED BARRIERS TO IMMUNIZATION

Penta 3 coverage in South Sudan shows uneven trend over the past 3 years with persistent low coverage observed in former Jonglei, Eastern Equatoria, Upper Nile, and Unity state hubs

Country Profile: Nigeria

SOCIO-DEMOGRAPHIC DATA ¹⁵⁻²⁵²⁵		
Population	Total (206,140,000), sex ratio (102.8 males per 100 females)	
Religion	49.3% Christian and 48.8% Muslim, 2% other or no religions	
Literacy rate	>15 years (2016): 52.7% for females and 71.3% for males 15-24 years (2016): 68.3% for females and 81.6% for males	
Gender inequality index	Ranking (2020): No ranking available	
Political stability	Estimate: -1.93, percentile rank 5.24/100	
Internally displaced persons	2,730,000 due to conflict and 143000 due to disasters	
	IMMUNIZATION-SPECIFIC INDICATORS	
DTP3 Coverage	Coverage increased from 9% (1984) to 57%(2019)	
Coverage by gender	No evidence of important differences in coverage between boys and girls at national level	
Health care workers	Nurses and doctors tend to be females	
GAVI JOINT APPRAISAL REPORT 2019: GENDER RELATED BARRIERS TO IMMUNIZATION		
Trends in state-level vaccination coverage (based on data from NDHS 2013 and 2018) suggests improved coverage in the Northern states and a decline in some Southern States.		
Kano, Kaduna and Katsina continue to harbor the largest number of unvaccinated children		
Penta3 coverage and unimmunized children per state, NDHS, 2018		

Children born to uneducated mothers have the lowest coverage.

Country Profile: Somalia

SOCIO-DEMOGRAPHIC DATA ¹⁵⁻²⁵	
Population	Total (15,893,000), sex ratio (99.4 males per 100 females)
Religion	99% Muslim, 1% Christians, Sufi Muslim, Shia Muslims, Hindus, Buddhists, Jews, and those not affiliated with any religion.
Literacy rate	Not available
Gender inequality index	Ranking (2020): No ranking available
Political stability	Estimate: -2.38, percentile rank 2.86/100
Internally displaced persons	2,968,000 due to conflict and 1,330,000* total due to disasters (*New displacements)
	IMMUNIZATION-SPECIFIC INDICATORS
DTP3 Coverage	Coverage increased from 2% (1980) to 42% (2019)
Coverage by gender	No evidence of significant differences in coverage between boys and girls at national level though coverage tends to be higher among males

GAVI JOINT APPRAISAL REPORT 2019: GENDER RELATED BARRIERS TO IMMUNIZATION

Over the last two and half decades, internal and external conflict continued have affected healthcare access. Significant areas of the country especially Central South remains under the influence of terrorist groups and areas recovered from the insurgency are especially volatile

Recurrence of natural emergencies like Drought and Flooding in major areas of Somalia due to seasonal heavy rains and spells of dry weather affect the performance of immunization the national program. Although large scale famine has been averted in 2017, the humanitarian impact of the drought was devastating. More than half of the population needed humanitarian assistance and protection

Appendix 3 - Literature Search Criteria

PUBMED

((("expanded program on immunization"[tiab] OR "routine immunization delivery"[tiab] OR "routine immunization"[tiab] OR "routine immunization data"[tiab] OR "childhood vaccines"[tiab])

AND

("gender"[tiab] OR "boys and girls" [All Fields] OR "equity" [All Fields] OR "equality" [All Fields] OR "caregiver"[tiab] OR "barriers"[tiab]))

NOT

("HPV" [tiab] OR "COVID" [tiab] OR "United States" [tiab] OR "adolescent vaccine" [All Fields]))

EMBASE

((("expanded program on immunization":ab,ti OR "routine immunization delivery":ab,ti OR "routine immunization data":ab,ti OR "childhood vaccines":ab,ti)

AND

("gender":ab,ti OR "boys and girls" OR "equity" OR "equality" OR "caregiver":ab,ti OR "barriers":ab,ti)) **NOT**

("HPV":ab,ti OR "COVID":ab,ti OR "United States":ab,ti OR "adolescent vaccine"))

GOOGLE SCHOLAR

Initial Search

("expanded program on immunization" OR "routine immunization delivery" OR "routine immunization" OR "routine immunization data" OR "childhood vaccines")

AND

(gender OR "boys and girls" OR "equity" OR "equality" OR "caregiver" OR "barriers")

Directed Search on Conflict Settings

("Conflict affected" OR "Conflict-affected" OR "Conflict zone" OR "Conflict setting OR War") **AND**

("expanded program on immunization" OR "routine immunization" OR "childhood vaccines") **AND**

(Gender OR autonomy OR empowerment OR agency OR mobility OR "decision making")

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