

Chapter 1

Birth Registration, Child Rights and Local Governance in Bangladesh

Abu S. Shonchoy

Florida International University, 11101 S.W. 13 ST., Miami, FL 33199, USA,
e-mail: shonchoy@fiu.edu

Zaki Wahhaj

University of Kent, School of Economics, Canterbury, Kent, CT2 7FS, UK,
e-mail: z.wahhaj@kent.ac.uk

Abstract: Historically, the practice of registering births with government authorities has been rare in developing countries, limited to major urban centres. The absence of systematic birth records can be a serious impediment for implementing government policies related to children such as school enrolment requirements for children of primary school age or restrictions on minimum age of marriage. Recent initiatives to create digital birth records in a number of countries has the potential to address this issue and enhance the capacity of local government authorities to implement state policies. In Bangladesh, there has been increased provision of birth registration at local, government-run digital centres linked to a national database, and having a birth certificate has been made a requirement for receiving various government services including school enrolment and marriage registration. Using first-hand data from a rural district in one of the poorest regions in Bangladesh, we document the knowledge, understanding and behavioural

response in relation to these policies at the household level. We also document the phenomenon of invalid birth certificates and provide suggestive evidence that it is due to limited local administrative capacity to register births.

1 Introduction

Article 7 of the United Nations Convention of the Rights of the Child mandates that every "child shall be registered immediately after birth."¹ Although the convention has been ratified by most countries around the world, universal birth registration remains far from reality in many of them. About two-thirds of children under five are registered but the registration rate varies from over 90% in industrialised countries to less than 50% in sub-Saharan Africa and South Asia (UNICEF 2013). Birth registration rates also vary widely within countries, with higher registration rates in major cities compared to rural areas, and for babies born in hospitals compared to those born at home (UNICEF 1998). Without a well-functioning birth registration system, a modern state cannot ensure that key services (access to health care, education and social welfare programmes) and legal protection (against early marriage, child labour, military service, child trafficking) extend to all children born within it. Given the immense potential social benefits of birth registration and other forms of vital registration, the World Bank and World Health Organization developed a 10-year Global Vital Registration Scaling Up Plan in 2014, with the goal of registering all births, deaths, marriages and other vital events by 2030.²

Presently, survey data on birth registration of children is available for a wide range of countries, allowing comparison of birth registration rates

¹The Convention, which was signed in 1989 and became effective in 1990, is an international human rights treaty that sets out the civil, political, economic, social and cultural rights of children. States that have ratified the Convention are bound to it by international law. As of present, it has been ratified by all United Nations members except the United States. Source: <https://www.unicef.org/uk/what-we-do/un-convention-child-rights/>

²The full scaling-up plan is available here: <https://www.worldbank.org/en/topic/health/publication/global-civil-registration-vital-statistics-scaling-up-investment>

across countries and regions and monitoring progress over time. However, it is important to recognize that governance issues may manifest themselves not just in the form of incomplete coverage but also reporting errors, the circulation of fake documents, and inconsistencies between archival records and digital databases.³ These types of problems may not be picked up through self-reported birth registration data or even spot checks on birth certificates carried out by enumerators.

To document this issue in a systematic manner, we conducted a household survey in rural Bangladesh which includes not only self-reported data on birth registration but also validity checks on birth certificates for a specific demographic group: unmarried adolescent girls. Birth registration status of adolescent girls is particularly important because of the high rate of underage marriage among women in Bangladesh – i.e. below the legal minimum age – and the legal protection provided, at least in theory, by birth registration documents.

The households could produce birth registration records for about 80% of the girls. Survey enumerators verified, for each birth certificate, whether it had a digital record in the national birth registration database on the basis of the birth certificate number. The exercise revealed that just 54% of the girls had a valid birth certificate. Controlling for individual and household characteristics, we find some significant differences in birth certification among adolescent girls across unions, i.e. the level of the local authority responsible for registering births and issuing birth certificates.⁴ But, differences across unions explain a much larger fraction of the variation in *validated* birth certificates, suggesting that the issue of invalid certificates is a problem stemming from governance issues at the level of the local authority. In line with this evidence, focus group discussions with local stakeholders reveal

³For example, in February 2022, a BBC Bangla news article reported that several million individuals in Bangladesh who had previously registered their births would need to re-register online as their previous birth registration records have 'disappeared' from the system during a process of digitising birth records. <https://www.bbc.com/bengali/news-60262339>

⁴A 'union' is the lowest tier of the local government administration in Bangladesh.

concerns about capacity constraints and corruption at the local level, as well as birth registration targets set by the central authority that are not aligned with local institutional capacity.

We contribute to a growing academic literature on birth registration in LMICs (World Bank 2016, UNICEF 2013, UNICEF 2015, Mohanty & Gebremedhin 2018, Ebbers & Smits 2022). A strand in this literature focuses on demand-side and supply-side factors that limit birth registration. An important finding from the existing body of work is that both parental/household-level characteristics and local/contextual factors are important determinants of birth registration. A second strand in the literature, which we review in Section 3, evaluates the efficacy of recent innovations in registration systems, often involving the use of new information technologies to develop and transmit digital birth records. This strand in the literature highlights that, in the absence of comprehensive local capacity building and mobilisation, these types of interventions ultimately may not realise their objective of improving birth registration rates in the long-run. Our findings are also related to an emerging literature providing rigorous empirical evidence on the role of active monitoring and verification through decentralized local governance, especially emerging e-governance platforms (Banerjee, Duflo, Imbert, Mathew & Pande 2020, Muralidharan, Niehaus & Sukhtankar 2016, Muralidharan, Niehaus & Sukhtankar 2020).

Our work contributes to the existing literature by documenting, and investigating the determinants of, invalid birth certificates. We argue that individual and household characteristics and limitations in local capacity in registering births may translate not only into low birth registration rates, but the reliability of existing birth records; the latter metric is missing from existing micro-level data on birth registration rates that are widely used in this literature.

The remainder of this chapter is organised as follows. In Section 2, we provide a conceptual discussion on factors that may undermine birth registration process in the presence of weak governance. In Section 3, we provide an overview of birth registration systems in LMICs and recent

interventions to improve birth registration rates, with a focus on innovations aimed at improving local institutional capacity. In Section 4, we describe the regulations and institutions underpinning the existing birth registration system in Bangladesh. Using data from our purposefully designed household survey, we present descriptive statistics on birth registration rates in rural Bangladesh and highlight the issue of invalid birth registrations in Section 5. In Section 6, we use a regression framework to investigate the determinants of birth certification as well as valid registration among unmarried adolescent girls, and discuss whether differences in birth registration at the local level could be due to administrative capacity. We discuss the implications of our analysis and provide conclusions in Section 7.

2 Conceptual Framework: Birth Registration Systems and Sources of Weakness

It is well-recognised by policymakers and international development agencies that an effective system for documenting births is critical for national governments to ensure access to essential services and legal protection against various sorts of harm reach all children.

Among advanced economies, most births are registered successfully within the recommended time period. By contrast, birth registration has not been a priority in the majority of Low and Middle Income Countries (LMICs), with a few exceptions. Lack of resources is the most important reason for the absence of an effective birth registration system in many LMICs.

It has long been known that in LMICs, there are vast differences in the birth registration facilities in urban and rural areas. However, there may be significant variation at the local level too because of political factors, cultural norms and the knowledge, understanding and priorities of parents. But there are other reasons why birth registration systems may be weak. Parents may not value the services and protection provided by the state sufficiently, or lack an understanding of the link between them and birth registration. In these cases, they may not take the appropriate steps and, perhaps just as

important, make political demands to ensure that the registration process is hassle-free and inexpensive. A recent review of the literature highlights both supply-side (legal barriers, poor infrastructure, limited resources) and demand-side factors (lack of sufficient perceived benefits net of costs) as factors contributing to low birth registration rates in LMICs (World Bank 2016).

It may also be that the legal protection provided by the state upon the registration of a child conflicts with traditional norms or the economic reality of the households in which the children are born. The traditional practice of marriage among adolescent girls soon after they reach puberty, which often contradicts the legal minimum age of marriage within the country, is a case in point. In these instances, parents may be reluctant to register their children or, at any rate, circumvent the process – for example, by misreporting the birth date – so that they are able to continue with traditional practices.

Local governance typically plays an important role in the birth registration system, either by actively collecting information on births, providing services that allow parents to register their children, issuing certificates, etc. Therefore, variation in the quality of local governance, may lead to variations in the efficacy of birth registration systems across locality and thus lead to inequitable access to government services and legal protection for children born in different parts of country.

3 Overview of birth registration systems in LMICs

A number of LMICs have long-standing civil registration systems. For example, in Botswana, a civil registration system was established at its independence, in 1966. At its inception, the registration of births and deaths was compulsory in towns and major villages only. But the registration of vital events became mandatory nationally in 1998. In 2003 Botswana's civil registration system was automated following the establishment of the Department of Civil and National Registration (DCNR). (Republic of Botswana & World Bank 2015).

In the case of the Philippines, the registration of all vital events (births, deaths, etc.) was made mandatory in 1930 through the Civil Registry Act. But public awareness and compliance was low due to the general lack of understanding of the process, high costs, and cultural and language barriers (Celeste & Caelian 2021). On the other hand, low per-capita income countries such as Armenia, Azerbaijan, China, Honduras, Kyrgyzstan, Mongolia, Sri Lanka and Tajikistan manage to register at least 90 per cent of births (UNICEF 1998).

Overall, birth registration in LMICs is characterised by low compliance. In Africa, one in seven registered children in school do not have a birth certificate. However, there exists major variability across regions and countries. For example, about 50% school-registered children possess birth certificate in Eastern and Southern Africa, while the corresponding number is 88% in West and Central Africa (UNICEF 2013).

In recent years, a number of studies have investigated to what extent demand-side and supply-side factors limit birth registration. The existing research reveals that both parental/household-level characteristics and local/contextual factors are important determinants of birth registration. For example, (Mohanty & Gebremedhin 2018) finds, using data from the India Human Development Survey-II, that the maternal autonomy and control over resources are important determinants of birth registration but the marginal effects of maternal autonomy also vary across districts in India. (Ebbers & Smits 2022) finds, using data from the Demographic and Health Surveys for 34 countries in sub-Saharan Africa, that household poverty, lack of education, absence of the father, and restricted autonomy of women, and belonging to a traditional religion affect registration negatively; but so do local factors such as lack of professional care during pregnancy, delivery and early life, and lack of local health care facilities. In a mixed-methods study of birth registration in south-eastern Kenya, (Pelowski, Wamai, Wangombe, Nyakundi, Oduwo, Ngugi & Ogembo 2015) highlight a different issue. A quantitative survey in the region designed to better understand the current state of registration and parental understanding and attitudes reveals high levels of awareness and low barriers to birth registration; yet over 50%

of children in the sample are unregistered. Based on responses by parents during focus-group discussions, the authors conclude that "a series of small annoyances, coupled with the lack of immediate incentive, ... add up to a deliberate decision by a parent that it is *not worth the trouble* of seeking registration" (p.898) and argue that this phenomenon may be present in other developing countries too.

In order to improve compliance with birth registration system, LMICs have introduced late fees, fines and even judiciary procedures. Such mechanisms could incentivise parents to complete birth registration on time. However, they could also create a burden for economically, socially and geographically marginalized families (UNICEF 2013). Moreover, in some countries, existing laws make it more difficult to register children born out of wedlock or when the father is absent. (Hanmer & Elefante 2015) provides a number of examples along these lines: In Egypt, the mother can register the birth of a child only if she provides proof of marriage. In Iran, both parents must appear before a civil registrar to register their child if their marriage has not been registered.

3.1 Interventions to Improve Birth Registration in LMICs

In recent years, a variety of interventions have been introduced in LMICs to improve birth registration processes. These interventions often include the use of digital technologies to transmit birth registration information from rural communities to local or regional administrative offices and/or improve human resources available at the local government level for collecting and recording the information. We provide a number of examples from the literature, with a focus on innovations aimed at improving local institutional capacity, to illustrate both the range of solutions considered as well as their potential pitfalls.

Malawi: In Malawi, the government introduced a national registration system in 2007. This involved the use of paper-based Village registers to record births and deaths as well as the number of people living in each village. The registers were maintained by village head-persons who were

also responsible for obtaining and recording the required information for village members (Singogo, Kanike, Van Lettow, Cataldo, Zachariah, Bissell & Harries 2013, Gadabu, Manjomo, Mwakilama, Douglas, Harries, Moyo, Makonokaya, Kang'oma, Chitedze & Chinsinga 2014, Gadabu, Ben-Smith, Douglas, Chirwa-Nasasara, Manjomo, Harries, Dambula, Kang'oma, Chiumia & Chinsinga 2018). Although the system allowed the recording of births and deaths, it was impossible to collate and analyse the data from villages in a timely basis due to poor infrastructure, limited human resources, and a poor transportation network. Paper registers were also easily damaged through manual handling or eaten by termites.

In March 2013, a pilot project involving the use of Electronic Village Registers (EVRs) was launched in a single village in an area without electricity and modern amenities (Gadabu et al. 2014). The EVRs were used to transmit data through wireless connections from the village head through a series of intermediaries to the District Commissioner. The EVR was designed to overcome challenges typical of rural communities in low-income countries: lack of electricity supply, low literacy levels, and lack of IT skills. In particular, the EVR setup included a touchscreen computer to overcome the lack of IT skills, a solar panel to overcome the problem of lack of electricity supply, and a user interface in the local language to overcome the language barrier to using standard digital technologies. Based on the success of the pilot, the project was scaled up in 2016 to 83 other villages with modifications to improve its user-friendliness and robustness (Gadabu et al. 2018).

Because of the low frequency of births and deaths at the village level, a village head in charge of an EVR typically interacted with the system just once every two to three months which meant that the operator had a low level of familiarity with the system, potentially leading to reporting errors. There were cases of double registration due to attempts to correct data entry errors, as well as under-reporting of births and deaths. Compared to the low frequency of use, the EVR system had a relatively high cost at US\$ 2,430 per village (Gadabu et al. 2018).

Tanzania: Tanzania's Civil Registration (CR) system is managed by

the government's Registration, Insolvency and Trusteeship Agency (RITA) within the Ministry of Justice and Constitutional Affairs. The system is operated through District Civil Registrars and Village Executive Officers (VEOs) who maintain a record of births and deaths reported by households in ledgers. Obtaining a birth registration certificate typically involves a series of visits by a relative to the VEO and District Civil Registrar's office over the course of several weeks (Kabadi, Mwanyika & de Savigny 2013). The system's lack of simplicity coupled with lack of commitment from VEOs to regularly visit villages and households as required means that very few births are reported and registered.

The Swiss Tropical and Public Health Institute (Swiss TPH) and the Ifakara health Institute implemented a project in Tanzania between September 2012 and March 2013 to explore the potential of adding a mobile phone step to the civil registration system. The project, called "Monitoring of Vital Events through the use of Technology or MOVE-IT" had its pilot in a rural setting and was developed to add a SMS technology process to the existing civil registration process. It was aimed at improving the functioning of the CR system by enabling the VEOs to electronically transfer the details of births and deaths to the District Civil Registrar through a cloud-based SMS platform. This would enable District Civil Registrars to effectively monitor households' compliance with the legally required reporting of births for registration and certification. It was expected that this would improve the rate of coverage of the CR system and lead to timely registration of births and deaths. The MOVE-IT project raised the rate of birth notifications by an impressive 86 percent at the end of the intervention period. The change in the number of birth certificates issued was, however, less impressive, rising by just 9 percent by the end of the intervention (Kabadi et al. 2013).

The use of government civil servants as VEOs created conflicts between their routine jobs and civil registration duties leading to few visits to households and villages to follow up birth events. Some VEOs preferred not to pay visits to villages but required parents of new-borns to make trips to their offices for the registration of births. This situation affected the reporting of births as well as the rate of registrations. Secondly, getting contractual

agreements from mobile network providers to enable VEOs to use their mobile phones for reporting events was problematic, adding to the inefficiency of the system and lowering the impact of the MOVE-IT project. In terms of coverage, some villages could not participate in the project due to a lack of mobile phone network coverage (Kabadi et al. 2013).

Ghana: Birth registration in Ghana is a legal requirement under the Registration of Births and Deaths Act (1965). The country is divided into 170 registration districts, each with at least one registration office. These offices are usually within the premises of or near public health facilities. Despite this legal framework, the registration of births in Ghana has been plagued by a shortage of registration offices and a lack of trained personnel, and this is particularly severe in rural areas. In most cases, the distance to the nearest registration office adds substantial indirect costs (such as time away from work and travel expenses) to the monetary cost of registering a child. Public awareness of the benefits of child registration seems generally low (Fagernäs & Odame 2013).

To address some of the challenges faced by the Ghanaian birth registration system, Plan International and UNICEF in collaboration with Ghana Births and Deaths Registry launched a birth registration campaign between 2004 and 2005. The campaign was aimed at extending the legal period for free registration of infants; incorporating birth registration in child health promotion weeks; training community health workers on how to register births quickly; using community registration volunteers; and registering children during celebrations (Fagernäs & Odame 2013). Over the campaign period, the registration of births increased substantially as birth registration services became easily accessible and the need to travel long distances to a registration centre was removed. While only 44% of children younger than 5 years were registered in 2003, the rate had increased to 71% in 2008. However, a full coverage of birth registration is yet to be achieved amidst slowing progress.

A second initiative to boost the progress of birth registration in Ghana is the implementation of a low-cost 'real-time' vital registration system

launched in 2006 in the Bonsaaso Millennium Village in the Ashanti Region. It integrated 'real-time' vital registration with a Verbal Autopsy system within an open-source electronic medical record to improve the coverage of maternal-child health services. The project involved the training of Community Health Workers (CHWs) on the delivery of health information and services to households, data gathering on vital events (births and deaths) and transfer of same to the OpenMRS (a medical record system) using introspective data entry (Ohemeng-Dapaah, Pronyk, Akosa, Nemser & Kanter 2010).

The project led to a rise in the the number of health facilities established and the number of health personnel trained within the project area. The large presence of health facilities reduced the travelling distance for households while the rise in the number of professional health workers, including skilled birth attendants and community health workers, led to a shift in births from home delivery to delivery at health clinics. Thus, births became more visible and registered more promptly (Ohemeng-Dapaah et al. 2010). The project was largely successful because birth registrations seemed accurate and easy to implement. It is worth noting here that a high level of community mobilisation as well as an awareness and appreciation of the work of the Community Health Workers was essential to its success.

Liberia: Birth registration was reinstated in Liberia as part of the government's post-civil war reconstruction and development efforts. It was recognised that every child had a right to be registered and efforts were made by the government to ensure that the country had a well-functioning and sustainable civil registration system. The process of birth registration was centrally managed by the Liberian Ministry of Health and Social Welfare (MoHSW) with offices in the capital city Monrovia (Virhiä, Roberts, Itälä & Varpilah 2010). This centrally controlled process proved very inefficient as most of the citizens found it difficult to travel to the capital city to register a child's birth. As a result, only about 5 percent of children under the age of five were registered in 2007 (Toivanen, Hyvönen, Wevelsiep & Metsäniemi 2011).

A decentralization of the birth registration process was eventually em-

barked upon by the government. This involved the establishment of health districts across the country, appointing County Registrars (CRs), District Health officers (DHOs), and General Town Chiefs (GTCs) to provide birth registration services at their respective levels of jurisdiction. The process of registering a birth begins with a visit by the DHO to the village or community to collect already filled registration forms from the General Town Chiefs. These are forwarded as is by the DHOs to the County Registrar's office and then to the national office of the MoHSW in Monrovia for processing. Birth certificates would then be printed at the central level and sent back to households through the DHOs and local chiefs. Although easy to implement, the paper-based decentralization had several drawbacks including the possible loss of information through the manual handling of forms, the difficulty of interpreting handwritten information by third parties, and the need to transfer information from paper-based forms to a digital database often created huge pressure on the central office personnel leading to long delays in the registration process (Virhiä et al. 2010).

A mobile birth registration (MBR) project was launched in 2009 as part of the Liberian Government's Crisis Management Initiative (CMI), to complement the manual registration process (Virhiä et al. 2010, Toivanen et al. 2011). The MBR was designed to facilitate the collection of birth registration data in rural communities, minimise the need for long distance travel to process registration information, and reduce the issuing time for birth certificates. The project utilized the Nokia Data Gathering (NDG) solution in gathering information on births from households. These were then transmitted through GPRS to the central Birth Registration database. At the same time, county registrars could download files to their electronic devices and print corresponding birth certificates for households within their respective counties. The pilot scheme, launched in a single county, achieved its goal of making birth registration services easily accessible to rural households in the pilot area. This success informed the government's plans to scale up the mobile birth registration project to all the counties in the country.

The discussion above illustrates how interventions in LMICs aimed at decentralising birth registration have had mixed results. In instances where

the decentralisation process has been accompanied by comprehensive capacity building and mobilisation at the local level – for example in Ghana and Liberia – the results have been impressive. But there have also been cases where local authorities lacked the capacity to adopt the innovations introduced – for example in Malawi and Tanzania – such that the interventions ultimately did not realise their objective of improving birth registration rates in the long-run.

But it is important to note that the existing literature also highlights a range of factors other than local administrative capacity that lead to low registration in LMICs including lack of public awareness, distance to – and difficulty in accessing – registration offices, monetary cost of registration, limited autonomy of the mother and absence of the father, as well as perceived low benefits of registration.

4 Current Birth Registration System in Bangladesh

The authority responsible for birth registration in Bangladesh is the LGD, Local Government Division (and its associate agencies), while the process oversight is done by the Civil Registration and Vital Statistics (CRVS) secretariat under the Government's Cabinet Division (PLAN-Bangladesh & EATL 2020). The LGD's registration activities are governed by the "Birth and Death Registration Act 2004" and operated by the Registrar General Office under LGD. LGDs operate in each of the eight divisions in Bangladesh, covering all 64 districts of the country. At the district level, birth registration is predominantly done by the Union Parishad (UP), the lowest tier of local government administration in Bangladesh – except for urban areas and cities where the birth registration is done by the Municipality or the City Corporation, respectively. The UP is headed by an elected representative that works under the sub-district administration, known as "Upazila Parishad."

As part of the "Digital Bangladesh" mandate introduced in 2008, the Bangladesh government established Union Digital Centers (UDC) in al-

most all the UPs in Bangladesh, operated under a Public-Private Partnership model, combining a government facility and a local entrepreneur as a service delivery agent. UDCs are equipped with computers and internet connections, facilitating one-stop service delivery for various services, including birth certification digitisation.

According to the current law (Birth and Death Registration Act 2004), it is mandatory to register birth for anyone born in the country irrespective of race, religion, or nationality. The rule specifies that the birth registration of newborns should be completed within 45 days of birth (UNICEF 2015). If the registration is completed within two years of birth, there are no fees associated with this process. However, registration after two years consists of various fees based on the fee structure depicted in Table 1. The detailed application and verification processes are described in Table 10 and Figures 5-6. According to the 2004 Birth and Death Registration Act, a birth certificate is required documentation for enrollment in the government primary schools, registering marriages, obtaining passports and national ID cards. Although a birth certificate is, officially, a document required for admission into schools, the rule may not be universally enforced. Hence the compliance rate is imperfect, especially in the rural area, as will become from our primary data analysis discussed below.

Table 1 Fee Structure of Birth Registration

	Fee Rate (in BDT)	
	Union Parishad and Municipality	City Corporation
Within 2 years of Birth	None	None
For every year, after 2 years of occurrences	5.00	10.00
For duplicate copies of Birth Certificates	25.00	25.00
For the correction of any clerical mistake	10.00	10.00

Note: 94 BDT = 1 USD (as of 5th July 2022).

The 2004 Birth and Death Registration Act came into force in 2006 and in the next five years, the birth rate registration rate for children under five increased sharply from 12% to 31% (UNICEF 2013). However, the registration rate declined thereafter, reaching 20% in 2014 before increasing to 25% in 2017-18 (NIPORT 2020). There is significant regional variation in registration rates: varying from 17% in Rajshahi Division to 34% in Sylhet Division.

5 Birth Registration in Rural Bangladesh

In this section, we provide evidence on birth registration patterns in rural Bangladesh based on a purposefully designed survey conducted in 2020. Survey data on birth registration of children is presently available for a wide range of countries. In particular, the MICS (Multiple Indicator Cluster Surveys) have collected birth registration data since 1999 and the DHS (Demographic and Health Surveys) have collected birth registration data since 1993. What makes the present survey in rural Bangladesh distinctive is that it includes not only self-reported data on birth registration but also independent checks on birth certificates for a particular demographic group, unmarried adolescent girls – for whom certificates numbers were recorded during the survey – against the national birth registration database.

5.1 Description of the Survey and Descriptive Statistics

The study sample was drawn from 240 communities (specifically sub-units of villages called 'paras') in the district of Gaibandha in northern Bangladesh.⁵ The communities are spread across five unions which are broadly similar in terms of population and geographic size as reported in table 2.

The process of identifying sample households was as follows. In late 2019, for each village included in the study, the research team requested

⁵Although the *para* has no administrative significance, the subdivision of villages into *paras* is widely practised in rural Bangladesh and residents tend to self-identify with the *paras* in which their homesteads are situated (White 1992).

Table 2 Area Characteristics

Union	Gojaria	Kanchipara	Udakhali	Uria	Vorotkhali
Population	19322	27067	25304	17057	23292
Area (in acre)	7118	6608	5171	5836	3521
No. of Households	4886	6946	6377	4294	5837

Note: Taken from Bangladesh Population Census 2011.

community elders to identify households within the village with unmarried girls in the age group 13 to 17 years. This exercise produced an initial listing of 2,498 households with unmarried adolescent girls in the 240 communities. The rationale for this sampling strategy is that the data collection was linked to a subsequent intervention aimed at reducing the incidence of female early marriage in the study communities.

A household survey was conducted in the listed households between February and March 2020. The survey provides two sources of information on the birth registration status of household members. First, the household head reported on the birth registration status of each member of the household, Second, for unmarried adolescent girls in the household, the enumeration team verified whether the girl had a birth certificate and subsequently checked whether the certificate had a digital record in the national birth registration database on the basis of the birth certificate number. The survey also included questions aimed at testing knowledge and understanding of the birth registration process among mothers with unmarried adolescent girls.

In addition to the quantitative survey, we conducted qualitative interviews and focus group discussions (FGDs) with local stakeholders to understand the local administrative capacity. We also conducted semi-structured interviews with the UDC entrepreneur responsible for birth registration in each of the 5 unions covered in the survey and collected information on their educational qualifications, IT training, birth registration training, procedures

they follow during birth registration and digitisation of existing birth records, and IT and other equipment available for birth registration work within the office. The interviewer also noted observations on the available equipment and office setup. We report on the findings from the qualitative and semi-structured interviews in Section 6.2 after reporting the findings from the quantitative analysis.

Table 3 presents summary statistics on the characteristics of the survey households. The households have, on average, about 4.9 members and about 79% of the households own land. The household head, on average, has 3.15 years of education, and aged 45 years and about 11% of household heads are women. In terms of these characteristics, the sample households are typical of rural households in Bangladesh.⁶

However, due to the sampling strategy, the households have more than twice as many girls as boys (on average 1.56 girls and 0.71 boys below age 18) and a marriage rate of about 1.8% among adolescent girls aged 13-17 years, much lower than the national average.⁷ Nevertheless, the survey data can provide important insights about birth registration patterns in rural Bangladesh and their determinants.

5.2 Birth Registration Status and Knowledge

Table 4 presents summary statistics for each household member recorded in the household survey. As reported in the last row of the table, the household head reports that birth registration has been done for 67% of the household members. But there is significant variation in birth registration by demographic group. Figure 1 shows the birth registration rate by sex and age for children up to age 18. For children aged 24 months or younger, the

⁶In the latest available Bangladesh Household Income and Expenditures Survey (2016-17), the average rural household size is 4.11 and the proportion of rural households that are headed by a woman is 11% (BBS 2017).

⁷Figures provided in the Bangladesh Demographic and Health Survey 2017-18 Final Report indicate a marriage rate of 43.1% among women aged 15-19 years, with 12.4% married by age 15 (NIPORT & ICF 2020).

Table 3 Survey Household Characteristics

	Count	Mean	SD	Min	Median	Max
Household size	2499	4.898	1.327	1	5	12
# boys in household	2499	0.709	0.719	0	1	4
# girls in household	2499	1.557	0.749	0	1	5
# girls married before age 18	2499	0.018	0.140	0	0	2
% girls married before 18	2489	0.944	7.671	0	0	100
Household ann. income (000 BDT)	2494	117.350	117.373	0	96	4000
Household owns any land	2493	0.792	0.406	0	1	1
Age (yrs) of h'head	2449	44.523	9.328	14	44	95
Female h'head	2449	0.115	0.319	0	0	1
Education Level of Head:						
Never been to school	2449	0.312	0.464	0	0	1
Class 1-10	2449	0.379	0.485	0	0	1
Pre-sch/Adult Education	2449	0.194	0.395	0	0	1
High School/ College	2449	0.096	0.295	0	0	1
Degree/Higher Education	2449	0.019	0.136	0	0	1

Note: In 51 households, no member present is designated as the head.

figure is 58% for boys and 45% for girls. The registration rate increases to about 60% for children aged 3-6 years, with girls in this age nearly catching up but still lagging behind boys. For children aged 7-12 years, the figure rises to 85% for boys and 88% for girls, suggesting that a significant proportion of birth registration takes place at the time that a child is entering school. Within the same age group, just 1.27% have never been to school, implying that more than 10% of boys and girls aged 7-12 have enrolled in school without a birth certificate. Thus, there is imperfect compliance with the legal requirement that a birth certificate is shown when a child is enrolled in school (see Section 4). For adolescent girls aged 13-17 years, the household heads report that birth registration has been done in 95% of cases.

However, information from the validity checks on the birth certificates

Table 4 Summary Statistics on Household Members

	Count	Mean	SD	Min	Median	Max
Age - Years	12241	26.301	17.416	0	19	120
Female Member	12241	0.599	0.490	0	1	1
Education Classification:						
Never been to school	12241	0.205	0.404	0	0	1
Class 1-10	12241	0.581	0.493	0	1	1
Pre-sch/Adult Education	12241	0.113	0.317	0	0	1
High school/College	12241	0.086	0.281	0	0	1
Degree/Higher degree	12241	0.014	0.119	0	0	1
Occupation Type:						
Wage Labourer	12241	0.117	0.321	0	0	1
Salaried	12241	0.025	0.155	0	0	1
Self-employed	12241	0.033	0.179	0	0	1
Trader	12241	0.033	0.178	0	0	1
No Occupation	12241	0.749	0.434	0	1	1
Other	12241	0.044	0.206	0	0	1
Marital Status:						
Unmarried	12241	0.517	0.500	0	1	1
Married	12241	0.441	0.497	0	0	1
Widowed	12241	0.038	0.191	0	0	1
Divorced	12241	0.002	0.049	0	0	1
Separated	12241	0.001	0.037	0	0	1
Birth Registration	12241	0.670	0.470	0	1	1

of adolescent girls paints a somewhat different picture. Table 5 presents summary statistics for unmarried adolescent girls aged 13-17 included in the household survey. At the time of the survey, the sample households had 2,643 adolescent girls living in them. In contrast to the figure provided by the household head, a birth certificate could be produced for about 80% of the girls.⁸ In just 54% of cases, the adolescent girl had a birth certificate

⁸The primary reasons that respondents provided for being unable to show the birth certificate

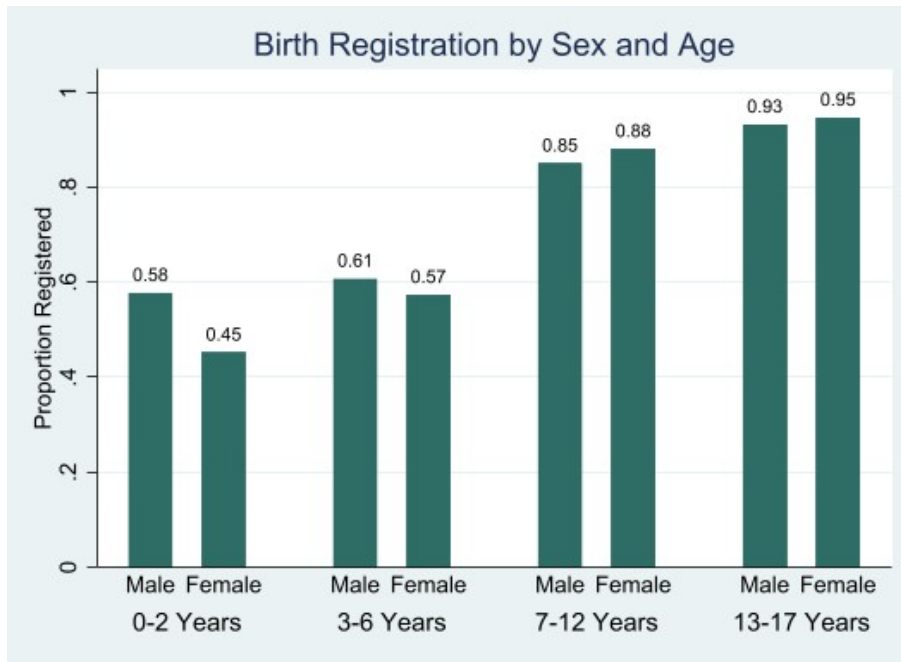


Fig. 1 Birth Registration by Sex and Age

that passed the research team’s validity check, i.e. a certificate with a digital record in the national birth registration database.⁹

We find some variation by union in the proportion of adolescent girls for whom a birth certificate could be produced, ranging from 85% in Vorotkhali union to 74% in Uria union. But the differences in validated birth certificates across unions are more pronounced, ranging from 66% in Gojaria union to just over half the same rate (38%) in Udakhali union. The differences in our two measures of birth registration across the 240 communities in the sample

were that the certificate was lost (35.6%), misplaced (38.3%) or that it was kept in the girl’s school (23.2%).

⁹There are two main reasons why there may be no digital record of the certificate in the national database. This may happen if the certificate is fake – i.e. produced by someone other than the proper authorities – or if it was issued by the proper authorities but mistakes were made in the registration process.

Table 5 Summary Statistics on Adolescent Girls

	Count	Mean	SD	Min	Median	Max
Age of Girl	2643	15.135	1.190	13	15	17
Girl Enrolled in School/College	2624	0.960	0.196	0	1	1
Girl Current Grade	2514	8.252	1.785	1	8	13
Girl Birth Reg Status	2620	0.964	0.187	0	1	1
Showed Birth Certificate	2620	0.794	0.404	0	1	1
Validated Birth Certificate	2643	0.545	0.498	0	1	1
Father's Age	2223	45.099	8.165	17	45	95
Mother's Age	2511	36.677	6.592	18	35	70
Father Education:						
No Education	2223	0.318	0.466	0	0	1
Incomplete Primary	2223	0.305	0.461	0	0	1
Primary Education	2223	0.103	0.305	0	0	1
Incomplete Secondary	2223	0.121	0.326	0	0	1
Secondary/Higher	2223	0.152	0.360	0	0	1
Mother Education:						
No Education	2511	0.261	0.439	0	0	1
Incomplete Primary	2511	0.356	0.479	0	0	1
Primary Education	2511	0.114	0.318	0	0	1
Incomplete Secondary	2511	0.180	0.384	0	0	1
Secondary/Higher	2511	0.089	0.285	0	0	1

are even more striking: there are four communities where *all* adolescent girls have validated birth certificates and several where *none* of them do. Figure 2 shows a scatterplot of the proportion adolescent girls for whom birth certificates could be shown and validated by community. As the figure shows, there is wide variation in both measures across the communities.¹⁰

¹⁰Note that in a small number of communities the proportion for whom birth certificate could be shown was lower than the proportion with validated birth certificates. This may be because the two checks were conducted on different days and some respondents could not show a birth certificate for the adolescent girl during the interview in spite of having

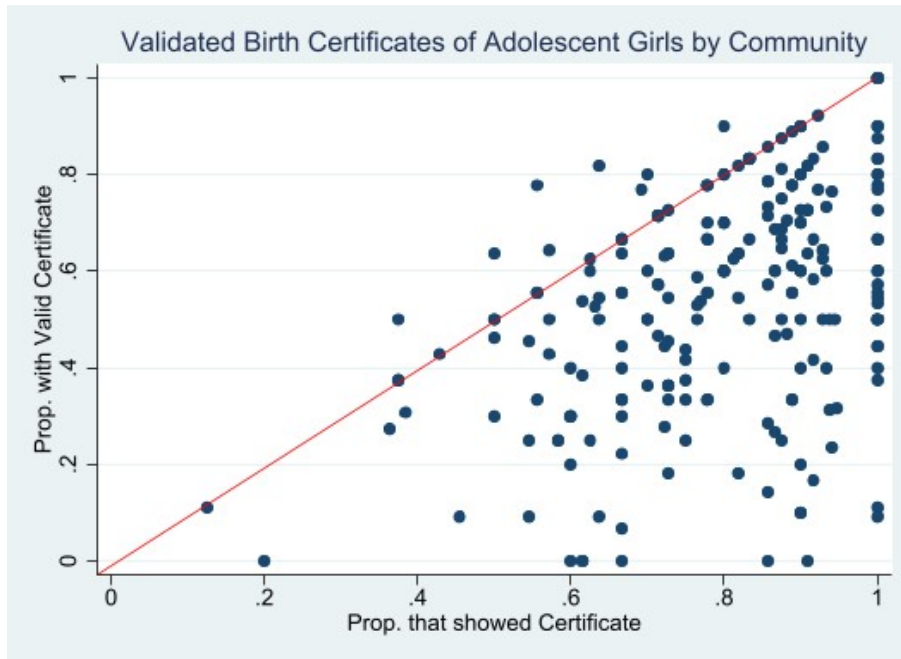


Fig. 2 Validated Birth Certificates of Adolescent Girls by Community

In Table 6, we present summary statistics on an adult household member’s knowledge about birth registration. These questions were intended for the mother of the adolescent girls in the household but, in cases where the mother was unavailable (about 16% of cases), the question was asked of the father. Most respondents had heard about birth registration (99%), knew where to go to register a child (94%), and that a child could be registered once only (92%). But less than half knew that the registration had to be done within 45 days of birth, and less than a quarter could mention a correct way of checking the validity of a birth certificate. On average, the respondents could mention about 2.9 reasons for, or advantages of, registering a child, with number of reasons provided ranging from 0 to 7.

a valid one.

We find some improvement in knowledge about birth registration by the level of education. Figure 3 shows the values of two of the knowledge variables by level of education, for adult female respondents only. As the figure shows, the proportion who are able to mention at least one correct method for checking for birth registration validity is increasing in the level of education, from about 15% among women with no education to about one-third for women in the sample who have completed secondary or higher education. As the figure shows, we obtain a similar pattern for knowledge about when to register a child although, in this instance, the relation between knowledge and education is not as strong. We do not find a relation for the other knowledge variables (figures not shown).

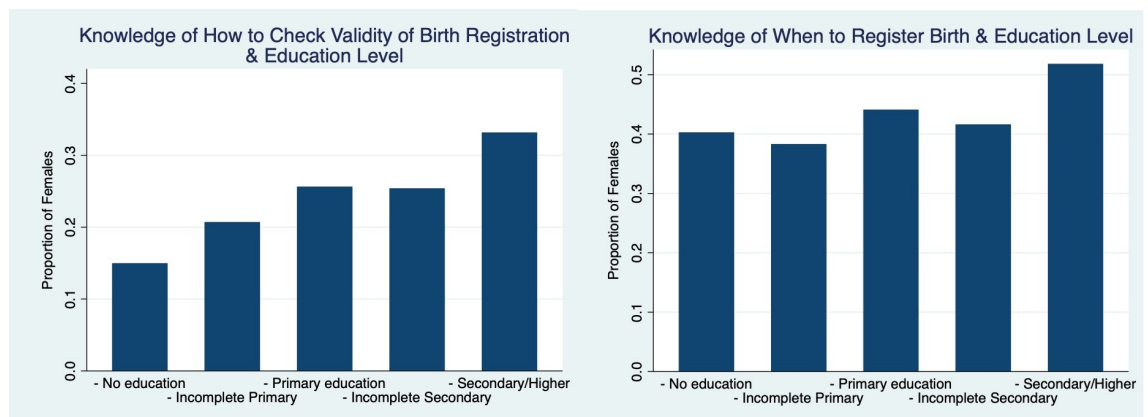


Fig. 3 Knowledge of Birth Registration versus Education

6 Threats to the Birth Registration System

6.1 *Determinants of Birth Registration among Adolescent Girls*

To better understand the factors behind the invalid birth certificates discussed in the previous section, we explore the determinants of birth registration

Table 6 Summary Statistics on Adult Knowledge

	Count	Mean	SD	Min	Median	Max
Age - Years	2485	38.174	9.086	13	35	90
Female Respondent	2485	0.844	0.363	0	1	1
Respondent Education Level:						
No Education	2485	0.260	0.439	0	0	1
Incomplete Primary	2485	0.344	0.475	0	0	1
Primary Education	2485	0.115	0.319	0	0	1
Incomplete Secondary	2485	0.171	0.377	0	0	1
Secondary/Higher	2485	0.110	0.313	0	0	1
Respondent relation to Head:						
Head	2485	0.251	0.434	0	0	1
Spouse	2485	0.697	0.460	0	1	1
Other relation to Head	2485	0.052	0.223	0	0	1
Heard about birth reg	2497	0.992	0.087	0	1	1
Knows when to do birth reg	2497	0.433	0.496	0	0	1
Knows where to do birth reg	2497	0.937	0.243	0	1	1
Knows # times birth reg can be done	2497	0.922	0.269	0	1	1
Knows how to check validity	2497	0.237	0.425	0	0	1
# advantages of birth reg mentioned	2497	2.917	1.046	0	3	7

status of adolescent girls in our survey sample within a regression framework. Specifically, we estimate linear probability models of the following form:

$$BRS_{ihvu} = \alpha + \mathbf{X}'_{ihvu}\beta + \mathbf{Z}'_{hvu}\gamma + \mathbf{N}'_{vu}\eta + \epsilon_{ihvu} \quad (1)$$

where BRS_{ihvu} is a binary variable indicating the birth registration status of person i in household h , community v , union u ; \mathbf{X}_{ihvu} is a vector of individual characteristics; \mathbf{Z}_{hvu} is a vector of household characteristics; \mathbf{N}_{vu} is a vector of gender norms measured at the community-level and ϵ_{ihvu} is the error term. Finally, α , β , γ and η are vectors of parameters to be estimated. In a second specification, we add fixed-effects at the level of the union as follows:

$$BRS_{ihvu} = \alpha + \mathbf{X}'_{ihvu}\beta + \mathbf{Z}'_{hvu}\gamma + \mathbf{N}'_{vu}\eta + \mathbf{d}'_u\delta + \epsilon_{ihvu} \quad (2)$$

where \mathbf{d}_u is a vector of union dummies in registering births and issuing certificates. As each union falls under the jurisdiction of a different UDC that registers births and issues certificates, sizeable union-level fixed effects may indicate variation in local administrative capacity in registering births and issuing certificates. In a third specification, we replace the union fixed-effects with community fixed-effects (and drop the community-level gender norms) as follows:

$$BRS_{ihvu} = \alpha + \mathbf{X}'_{ihvu}\beta + \mathbf{Z}'_{hvu}\gamma + \mathbf{c}'_{vu}\delta + \epsilon_{ihvu} \quad (3)$$

where \mathbf{c}_{vu} is a vector of community dummies. Although all communities within the same union are covered by the same UDC, there may be significant differences between them because of local transmission of information and attitudes, and imitation of good or bad practices across neighbours. There may also be systematic variation across communities in terms of wealth and occupational composition of households, as well as attitudes towards child marriage, and female schooling. Sizeable community-level fixed-effects would indicate that at least some of these factors are important determinants of birth registration.

Table 7 reports on estimates of equations 1 to 3 using the availability of any birth certificate as the dependent variable. The explanatory variables include the age of the girl, household demographic characteristics, education level of the mother and the household head, the mother's knowledge about birth registration and 12 distinct measures of community gender norms. We interpret the estimated coefficients not as causal effects but as indicating the predictive ability of a range of predetermined characteristics.

Before discussing the results, it is also worth noting that because the sample includes *unmarried* adolescent girls only, the estimated coefficients may be affected by selection bias. In particular, if certain socio-economic characteristics reduces risk of early marriage as well as positively affect birth certification, this will lead to a downward bias in our point estimates. For this

reason, in the following discussion we focus primarily on the community-level and union-level variables: as community- and union-level factors are less likely to affect marriage timing than household- and individual-level factors.

Of the explanatory variables, the only one that 'affects' the probability of having a birth certificate across all three specifications is the mother's level of education. In fact, other things equal, if the mother has secondary or higher education, the girl is about 8-10% points *less likely* to have a birth certificate than one whose mother has never attended school.

We also find that three of the gender norm variables have predictive power regarding the presence of a birth certificate in both specifications that they are included: the proportion of respondents in the community who agree with the statements that 'A man should be the sole decision maker', 'Girls should marry before 18' and 'Secondary school education is more important for a boy than for a girl'. Increased agreement with any of these statements within the community decreases the probability that a girl has a birth certificate.

The individual, household and community characteristics explain just 4% of the variation in birth certificates among adolescent girls, as indicated by the R-square in column 1 of Table 8. The inclusion of union fixed-effects in column 2 improves the R-square only slightly to 0.058. The estimated coefficients for the union dummies indicate some variation in the birth certification rate across unions: in Uria, the rate is about 11% points lower than in the reference union Gojaria and about 19% points lower than in Vorotkhali. The inclusion of community fixed-effects improves the R-square to 0.171: thus, a significantly larger part of the variation in birth certification is explained by differences across communities – that, within union boundaries, are served by the same local authority – than at the union-level.

Table 8 reports on estimates of equations 1 to 3 using the availability of a valid birth certificate as the dependent variable. The explanatory variables are identical to those in Table 7. Again, we find that the only explanatory

variable that 'affects' the probability of having a valid birth certificate across all three specifications is the mother's level of education: an adolescent girl whose mother has secondary or higher education is about 10-12% points *less likely* to have a birth certificate than one whose mother has never attended school. Unlike the case of any birth certification, none of the gender norm variables consistently predicts valid birth certification.

The individual, household and community characteristics explain just 2% of the variation in valid birth certificates among adolescent girls. The inclusion of union fixed-effects improves the R-square substantially to 0.070. And we obtain larger differences in the rates of valid birth certification across unions compared to the case of any birth certification discussed above: in Udakhali and Vorotkhali unions, the rates are 28 and 22% points respectively lower than in the reference union Gojaria. In another union, Uria, the valid birth certification rate is also lower than in the reference union by 8% points. The inclusion of community fixed-effects improves the R-square further to 0.221 .

The persistently negative coefficient in Tables 7 and 8 for the dummy variable corresponding to the attainment of secondary or higher education by mothers merits further comment. At first sight, the pattern is puzzling since women with secondary education appear to have better knowledge about birth registration (Figure 3). But recall that the sample used for the regression analysis includes only *unmarried* daughters. Mothers with less education are more likely to have *married* adolescent girls (confirmed in our data) who are, thus, absent from the sample. If married adolescent girls have a lower birth registration rate (which we cannot confirm on the basis of our data as reliable birth certification data was collected for unmarried adolescent girls only but is a plausible hypothesis), this would inflate, within the sample, the birth registration rate for girls whose mothers have less education compared to girls whose mothers have completed secondary education. ¹¹

¹¹Consistent with this reasoning, the birth registration rate for adolescent girls in the sample whose mothers have completed secondary education is 9-10% points lower than those whose mothers have less education. This pattern holds both for any birth certificate and for validated birth certificates.

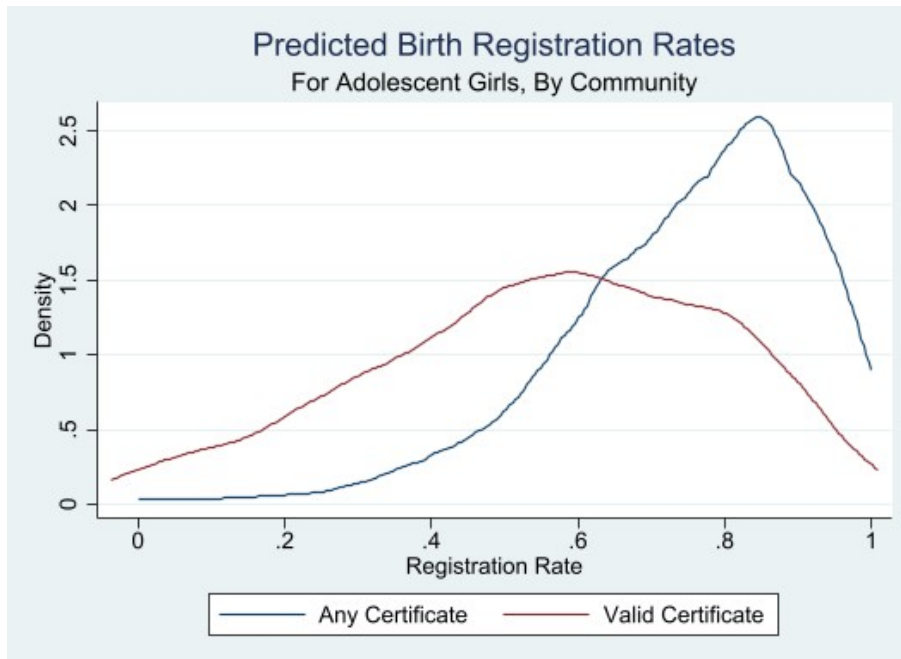


Fig. 4 Predicted Birth Registration Probability for Adolescent Girls by Community

6.2 *Invalid Birth Registration and Governance*

Using the estimates in column 3 of Tables 7 and 8, we can calculate the predicted probability of having any birth certificate and a validated birth certificate by community. Figure 4 above shows the distribution of these predicted probabilities across communities using sample mean values of all other covariates in the respective models. Both distributions are single-peaked and, as expected, the mode of the distribution of the predicted probabilities of validated birth certificate is lower than that of any birth certificate. More strikingly, we observe a much wider spread in predicted probabilities across communities in the case of validated birth certificates. This pattern is also

reflected in the predicted probabilities calculated at the level of the union shown in Table 9.

These patterns raise the question whether the differences in valid birth certification among adolescent girls across unions could be attributed to local institutional capacity to register births and maintain birth records. In focus group discussions on birth registration with local stake-holders, participants highlighted a number of governance issues leading to low compliance: lack of education and awareness within the local Union Parishad leadership, lack of experience among the Union Digital Centre (UDC) staff in registering births, corruption and nepotism leading to lack of appropriate equipment for registering births in the UDC and unqualified persons being assigned to the UDC, and unrealistic targets set by the Bangladesh Government to process birth registrations within a set time-frame without sufficient investment in capacity building. The semi-structured interviews with the 5 UDC entrepreneurs also revealed large variation in the technical and management capacity of the UDC entrepreneurs, in terms of educational qualifications, IT training, training on digitisation of birth registration records, and practices in terms of documentation, security, file management and archiving records.¹²

In the absence of systematic large-scale data on local institutional capacity, it is difficult to verify to what extent the issue of invalid birth certificates is due to local institutional capacity. However, we highlight here some suggestive evidence in line with this hypothesis. There are large differences in *overall* self-reported birth registration rates (more precisely, as reported by the household head) across the five unions covered in our survey: 86% in Gojaria, 77% in Uria, 66% in Vorotkhali, 65% in Udakhali and 52% in Kanchipara. Given that these unions are broadly similar in terms of demographic composition, and that there is little reason to expect systematic differences in reporting errors across unions, these figures can be interpreted as rough indicators of local institutional capacity relating to the creation and maintenance of birth registration records.¹³

¹²As these interviews involved just 5 individuals, we do not provide further details on the responses to avoid disclosing personal information.

¹³Although the self-reported birth registration data is based on the household survey, recall

The variation in birth registration rates across unions suggests that there are large differences in local institutional capacity. Moreover, with the exception of the union of Kanchipara, the ordering of the unions in terms of overall birth registration rates are identical to the ordering implied by the predicted valid birth registration probabilities in Table 9, suggesting that this variation may be due to differences in local institutional capacity. More precisely, the differences in the technical and management capacity of UDC entrepreneurs observed through the semi-structured interviews (in terms of IT training, training on digitisation of birth registration records, and the adoption of practices for documentation, security, file management and archiving records) are plausibly responsible for at least part of the variation in validated birth registration certificates across unions.

7 Conclusion

In theory, decentralisation should improve efficiency in governmental activities that require reliable local information. Well-known examples are real estate and property tax collection as tax assessment requires property valuation, which can be done much more accurately at the local level rather than by a central administration. Similarly vital registration, including birth registration and the digitisation of birth records, conducted at the lowest administrative level allows use of localised information support and lowers transaction costs. Although decentralisation should make these processes more cost-effective, weaker administrative capacity due to supply-side issues (such as corruption, nepotism, inadequate infrastructural support and inexperienced service providers) could dilute decentralized efforts of providing birth registrations locally – making the compliance standard of such activities questionable, with potentially important consequences on public policy responses in other vital areas.

from Section 4 that it is based on a different question and procedure to that used to check for valid birth registration.

We explore this issue in a setting where valid birth registration could potentially help to reduce the incidences of female early marriage. Bangladesh has one of the highest rates of female early marriage in the world. The latest figures indicate that about 59% of women marry before reaching the age of 18 (Amin, Asadullah, Hossain & Wahhaj 2019). The practice is strictly prohibited by the Child Marriage Restraint Act 2017. But law enforcement agencies require a valid documentation of age to take necessary action against the practice while the current birth registration rate in Bangladesh is far from universal. Although there are demand driven issues – for example, lack of awareness on the importance of the birth registration by rural parents (many of them are low educated and often illiterate) – we provide suggestive evidence of substantial supply-side constraints.

Evaluating the birth registration issues of a rural district in Bangladesh, we document that nearly one-third of the sample did not have their birth registered at the time of the survey with a sizeable gender gap (58% of boys are registered compared to 45% of girls) for children aged 0-24 months. For girls aged 13-17 years (an age group that is highly susceptible to female early marriage), the household was able to show the birth registration document in 80% of cases. However, the research team’s validity check against records in the national database revealed that 46% of those documents were, in fact, invalid.

The survey also revealed that while most rural households have basic knowledge about birth registration, fewer than half knew the deadline for completing the registration without incurring a registration fee, and less than a quarter knew how to check the validity of a birth certificate. What is more striking is the local-level variation in compliance rates. Our estimates indicate that there are statistically significant discrepancies in the local government’s ability to produce valid birth certificates, ranging from 38.56% to 66.76% across five local authorities within a single district in Bangladesh. Relatedly, using data drawn from semi-structured individuals with the entrepreneurs responsible for birth registration at the union-level, we find large differences in terms of educational qualifications, IT training, training on digitisation of birth registration records, and practices (data secu-

rity, file management, archival procedures) across the union digital centres (UDCs). And differences across unions explain a much larger fraction of the variation in *validated* birth certificates than the presence of any certificate. We argue that the issue of invalid certificates is a problem stemming from administrative capacity at the level of the local authority.

We conclude with two policy implications of our findings. The differences in qualifications, resources and processes across Union Digital Centres – evident from our survey of UDC entrepreneurs – indicate that the provision of up-to-date training (and refresher courses) and equipment would help to improve the quality of birth registration process in rural Bangladesh. Birth certificate validity checks along the lines conducted for this study can easily be replicated by schools; and can help identify unions with high rates of invalid certificates, and thus the UDCs that could benefit from such training and investments. Although the institutional setup for birth registration differs across countries, this two-pronged strategy may also help improve birth registration rates and the reliability of birth registration records in other developing countries. In turn, digitisation of birth registration records – and allocating resources and training to ensure that the birth registration system is effective – can significantly improve state capacity to deliver a range of public services to citizens, similar to the effects of biometrically authenticated payment infrastructures obtained by (Muralidharan et al. 2016).

References

- Amin, S., Asadullah, N., Hossain, S. & Wahhaj, Z. (2019). Is the law enough to end child marriage?, *Technical report*, LSE International Development Blog.
URL: <https://blogs.lse.ac.uk/internationaldevelopment/2019/11/08/is-the-law-enough-to-end-child-marriage/>
- Banerjee, A., Duflo, E., Imbert, C., Mathew, S. & Pande, R. (2020). E-governance, accountability, and leakage in public programs: Experimental evidence from a financial management reform in india, *American Economic Journal: Applied Economics* **12**(4): 39–72.
- BBS (2017). Preliminary report on household income and expenditures survey 2016, *Technical report*, Bangladesh Bureau of Statistics, Dhaka.
- Celeste, J. G. & Caelian, M. V. (2021). Civil registration awareness, compliance, purpose, and challenges among municipal residents in the philippines, *Philippine Social Science Journal* **4**: 104–114.
- Ebbers, A. L. & Smits, J. (2022). Household and context-level determinants of birth registration in sub-saharan africa, *PloS one* **17**(4): e0265882.
- Fagnäs, S. & Odame, J. (2013). Birth registration and access to health care: an assessment of ghana's campaign success, *Bulletin of the World Health Organization* **91**: 459–464.
- Gadabu, O., Ben-Smith, A., Douglas, G., Chirwa-Nasasara, K., Manjomo, R., Harries, A., Dambula, I., Kang'oma, S., Chiumia, T. & Chinsinga, F. (2018). Scaling up electronic village registers for measuring vital statistics in rural villages in malawi, *Public health action* **8**(2): 79–84.
- Gadabu, O., Manjomo, R., Mwakilama, S., Douglas, G., Harries, A., Moyo, C., Makonokaya, L., Kang'oma, S., Chitedze, P. & Chinsinga, F. (2014). An electronic register for vital registration in a rural village with no electricity in malawi, *Public health action* **4**(3): 145–149.
- Hanmer, C. & Elefante, M. (2015). The role of identification in ending child marriage: Identification for development (id4d), *Technical report*, World Bank, Washington D.C.

- Kabadi, G., Mwanyika, H. & de Savigny, D. (2013). Innovations in monitoring vital events: mobile phone sms support to improve coverage of birth and death registration: a scalable solution.
- Mohanty, I. & Gebremedhin, T. A. (2018). Maternal autonomy and birth registration in india: Who gets counted?, *PloS one* **13**(3): e0194095.
- Muralidharan, K., Niehaus, P. & Sukhtankar, S. (2016). Building state capacity: Evidence from biometric smartcards in india, *American Economic Review* **106**(10): 2895–2929.
- Muralidharan, K., Niehaus, P. & Sukhtankar, S. (2020). Identity verification standards in welfare programs: experimental evidence from india, *Technical report*, National Bureau of Economic Research.
- NIPORT (2020). Bangladesh demographic and health survey 2017–18.
- NIPORT & ICF (2020). Bangladesh demographic and health survey 2017-18, *Final report*, NIPORT and ICF, Dhaka, Bangladesh, and Rockville, Maryland, USA.
- Ohemeng-Dapaah, S., Pronyk, P., Akosa, E., Nemser, B. & Kanter, A. S. (2010). Combining vital events registration, verbal autopsy and electronic medical records in rural ghana for improved health services delivery, *MEDINFO 2010*, IOS Press, pp. 416–420.
- Pelowski, M., Wamai, R. G., Wangombe, J., Nyakundi, H., Oduwo, G. O., Ngugi, B. K. & Ogembo, J. G. (2015). Why don't you register your child? a study of attitudes and factors affecting birth registration in kenya, and policy suggestions, *The Journal of Development Studies* **51**(7): 881–904.
- PLAN-Bangladesh & EATL (2020). Digital birth registration in bangladesh. technical analysis study: strengthening crvs in bangladesh through the appropriate use of digital technologies.
- Republic of Botswana & World Bank (2015). Integration of civil registration and vital statistics and identity management systems: Botswana success story, *Technical report*, World Bank, Washington D.C.
- Singogo, E., Kanike, E., Van Lettow, M., Cataldo, F., Zachariah, R., Bissell, K. & Harries, A. (2013). Village registers for vital registration in rural malawi, *Tropical medicine & international health* **18**(8): 1021–1024.

- Toivanen, H., Hyvönen, J., Wevelsiep, M. & Metsäniemi, M. (2011). Mobile birth registration in Liberia: Cmi project mid-term review.
- UNICEF (1998). Unicef on deficient birth registration in developing countries, *Population and Development Review* **24**: 659–664.
- UNICEF (2013). Every child's birth right: Inequities and trends in birth registration, *Final report*, UNICEF, New York.
- UNICEF (2015). Birth registration: A comparative report prepared for unicef, *Final report*, UNICEF, New York.
- Virhiä, T., Roberts, G., Itälä, T. & Varpilah, T. (2010). Mobile solution for birth registration in Liberia: A case study of using ICT in statebuilding, *2010 Ninth International Conference on Mobile Business and 2010 Ninth Global Mobility Roundtable (ICMB-GMR)*, IEEE, pp. 448–452.
- White, S. C. (1992). *Arguing with the crocodile: gender and class in Bangladesh.*, Zed Books.
- World Bank (2016). Incentives for improving birth registration coverage: A review of the literature, *Technical report*, World Bank, Washington DC.

Table 7 Determinants of Any Birth Certificate

VARIABLES	(1) Any_BRC	(2) Any_BRC	(3) Any_BRC
Age of Girl	-0.006 (0.008)	-0.007 (0.008)	-0.008 (0.008)
# Siblings	0.006 (0.017)	0.013 (0.016)	0.013 (0.018)
Birth Order	-0.004 (0.013)	-0.005 (0.014)	-0.008 (0.015)
Household size	-0.008 (0.010)	-0.011 (0.010)	-0.012 (0.011)
Log of household income	0.019 (0.016)	0.011 (0.015)	0.008 (0.016)
Female h'head	0.020 (0.030)	0.012 (0.030)	-0.006 (0.036)
Household owns land	-0.001 (0.022)	-0.001 (0.023)	-0.003 (0.027)
Muslim	-0.038 (0.042)	-0.042 (0.043)	-0.002 (0.043)
H'head Education = 1, Incomplete Primary	-0.002 (0.028)	-0.007 (0.027)	-0.017 (0.030)
H'head Education = 2, Primary education	0.062** (0.031)	0.065** (0.031)	0.048 (0.033)
H'head Education = 3, Incomplete Secondary	-0.023 (0.035)	-0.024 (0.034)	-0.021 (0.037)
H'head Education = 4, Secondary/Higher	-0.010 (0.035)	-0.011 (0.035)	-0.021 (0.037)
Mother's Education = 1, Incomplete Primary	-0.004 (0.027)	-0.001 (0.027)	0.016 (0.030)
Mother's Education = 2, Primary education	0.007 (0.037)	0.005 (0.037)	0.000 (0.039)

Continuation of Table 7

VARIABLES	(1) Any_BRC	(2) Any_BRC	(3) Any_BRC
Mother's Education = 3, Incomplete Secondary	0.002 (0.033)	-0.008 (0.033)	0.000 (0.036)
Mother's Education = 4, Secondary/Higher	-0.096** (0.044)	-0.104** (0.043)	-0.078* (0.047)
Age (yrs) of h'head	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.002)
Mother's Age	-0.002 (0.002)	-0.002 (0.002)	-0.003 (0.002)
Heard about birth reg	-0.065 (0.131)	-0.027 (0.127)	-0.009 (0.130)
Knows when to do birth reg	-0.009 (0.020)	-0.004 (0.020)	0.000 (0.023)
Knows where to do birth reg	0.018 (0.049)	-0.014 (0.049)	0.021 (0.054)
Knows # times birth reg can be done	0.063 (0.039)	0.064 (0.040)	0.038 (0.044)
Knows how to check validity	-0.026 (0.023)	-0.016 (0.024)	-0.010 (0.028)
# advantages of birth reg mentioned	0.016* (0.010)	0.014 (0.010)	0.017 (0.012)
Norm - Man should be sole decision maker	-0.132*** (0.046)	-0.136*** (0.042)	
Norm - Woman should not work outside	0.008 (0.040)	0.020 (0.038)	
Norm - Woman should not work outside 2	0.047 (0.030)	0.059** (0.028)	
Norm - Household work for all	-0.083 (0.062)	-0.077 (0.058)	
Norm - Woman should give income to man	0.075* (0.039)	0.053 (0.035)	

Continuation of Table 7

VARIABLES	(1) Any_BRC	(2) Any_BRC	(3) Any_BRC
Norm - Woman to ask permission to work	0.107* (0.064)	0.091 (0.059)	
Norm - Girls to marry before 18	-0.072* (0.040)	-0.074* (0.038)	
Norm - Girls only schools	0.013 (0.032)	-0.008 (0.030)	
Norm - Girls should finish sec school	0.029 (0.070)	0.069 (0.066)	
Norm - Boys should finish sec school	-0.040 (0.055)	-0.080 (0.054)	
Norm - Sec school more imp. for boys	-0.100*** (0.031)	-0.077*** (0.028)	
Norm - Boy more desirable as successor	0.035 (0.024)	0.027 (0.023)	
Union = 2, KANCHIPARA		0.035 (0.030)	
Union = 3, UDAKHALI		-0.002 (0.030)	
Union = 4, URJA		-0.111*** (0.040)	
Union = 5, VOROTKHALI		0.081*** (0.030)	
Observations	2,440	2,440	2,440
R-squared	0.040	0.058	0.171
Union FE		Yes	
Community FE			Yes

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Errors are clustered at the community-level. The dependent variable indicates whether the adolescent girl has any type of birth registration - whether valid or invalid. The sample includes all unmarried adolescent girls in the study area. In the third column the reference union is Gojaria.

Table 8 Determinants of Valid Birth Certificate

VARIABLES	(1) Valid_BRC	(2) Valid_BRC	(3) Valid_BRC
Age of Girl	-0.007 (0.009)	-0.003 (0.009)	-0.003 (0.009)
# Siblings	0.012 (0.019)	0.002 (0.018)	0.000 (0.019)
Birth Order	-0.000 (0.016)	0.010 (0.016)	0.005 (0.017)
Household size	-0.007 (0.012)	-0.004 (0.012)	-0.005 (0.013)
Log of household income	-0.001 (0.017)	0.004 (0.017)	0.011 (0.018)
Female h'head	-0.032 (0.039)	-0.004 (0.038)	0.019 (0.041)
Household owns land	-0.035 (0.029)	-0.012 (0.028)	-0.029 (0.031)
Muslim	-0.052 (0.052)	-0.048 (0.047)	-0.035 (0.050)
H'head Education = 1, Incomplete Primary	-0.003 (0.032)	-0.012 (0.031)	-0.029 (0.033)
H'head Education = 2, Primary education	0.029 (0.041)	0.020 (0.038)	0.018 (0.040)
H'head Education = 3, Incomplete Secondary	0.004 (0.040)	-0.002 (0.040)	-0.005 (0.041)
H'head Education = 4, Secondary/Higher	-0.008 (0.046)	-0.010 (0.044)	-0.020 (0.044)
Mother's Education = 1, Incomplete Primary	-0.005 (0.030)	-0.002 (0.030)	-0.003 (0.031)
Mother's Education = 2, Primary education	-0.007 (0.043)	-0.005 (0.041)	-0.009 (0.043)

Continuation of Table 8

VARIABLES	(1) Valid_BRC	(2) Valid_BRC	(3) Valid_BRC
Mother's Education = 3, Incomplete Secondary	-0.046 (0.041)	-0.036 (0.039)	-0.030 (0.040)
Mother's Education = 4, Secondary/Higher	-0.110** (0.050)	-0.103** (0.049)	-0.121** (0.051)
Age (yrs) of h'head	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)
Mother's Age	-0.003 (0.002)	-0.004** (0.002)	-0.004* (0.002)
Heard about birth reg	-0.178 (0.146)	-0.140 (0.141)	-0.162 (0.146)
Knows when to do birth reg	0.003 (0.023)	-0.008 (0.022)	-0.000 (0.023)
Knows where to do birth reg	0.034 (0.052)	0.001 (0.050)	0.017 (0.056)
Knows # times birth reg can be done	0.057 (0.046)	0.066 (0.046)	0.040 (0.047)
Knows how to check validity	0.001 (0.028)	-0.011 (0.028)	0.026 (0.031)
# advantages of birth reg mentioned	0.014 (0.011)	0.014 (0.011)	0.017 (0.013)
Norm - Man should be sole decision maker	-0.042 (0.064)	-0.030 (0.057)	
Norm - Woman should not work outside	-0.021 (0.058)	-0.022 (0.052)	
Norm - Woman should not work outside 2	-0.031 (0.041)	-0.027 (0.038)	
Norm - Household work for all	-0.081 (0.095)	-0.051 (0.083)	
Norm - Woman should give income to man	0.050 (0.054)	0.068 (0.048)	

Continuation of Table 8

VARIABLES	(1) Valid_BRC	(2) Valid_BRC	(3) Valid_BRC
Norm - Woman to ask permission to work	0.134 (0.090)	0.075 (0.080)	
Norm - Girls to marry before 18	0.008 (0.053)	-0.019 (0.049)	
Norm - Girls only schools	0.011 (0.047)	0.037 (0.041)	
Norm - Girls should finish sec school	0.081 (0.114)	0.011 (0.104)	
Norm - Boys should finish sec school	-0.046 (0.100)	0.010 (0.088)	
Norm - Sec school more imp. for boys	-0.028 (0.047)	-0.063 (0.043)	
Norm - Boy more desirable as successor	-0.042 (0.038)	-0.038 (0.035)	
Union = 2, KANCHIPARA		-0.017 (0.038)	
Union = 3, UDAKHALI		-0.284*** (0.043)	
Union = 4, URJA		-0.082* (0.046)	
Union = 5, VOROTKHALI		-0.222*** (0.038)	
Observations	2,440	2,440	2,440
R-squared	0.020	0.070	0.221
Union FE		Yes	
Community FE			Yes

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Errors are clustered at the community-level. The dependent variable indicates whether or not the adolescent girl has a birth certificate identified as 'valid' by enumerator. The sample includes all unmarried adolescent girls in the study area. In the third column the reference union is Gojaria.

Table 9 Predicted Birth Registration Probabilities

Union	Valid BRC	Any BRC
Gojaria	0.683	0.749
Kanchipara	0.665	0.785
Udakhali	0.399	0.747
Uria	0.601	0.638
Vorotkhali	0.461	0.831

Notes: The table shows the predicted birth registration probabilities for adolescent girls by union based on the estimates in Column 2, Tables 7 and 8. Sample mean values are used for all other covariates.

Appendix

Table 10 Birth Registration Process

Step	Process
1	<p>An applicant has to collect the supporting document to apply for birth registration certificate. The supporting documents are different for children under 5 years and above 5 years.</p> <p>Below 5 Years:</p> <ul style="list-style-type: none"> a) Attestation of the informant, or b) Attested copy of the vaccination (EPI) card, or c) Attested copy of hospital document or birth record, or d) Certification regarding NGO worker authorized by registrar in favour of date of birth, or e) Attested copy(s) of other document as prescribed by the Registrar. <p>5 Years and above:</p> <ul style="list-style-type: none"> a) As a proof of age, certificate from a medical (MBBS) doctor and as a proof of birth-place or permanent address, certificate from ward councillor is required, or b) As a proof of age and birth-place a certificate from the principal/head-teacher or any other teacher or officials nominated by the head of the academic institute is required as informant, or c) As a proof of age and birth-place attested copy of vaccination (EPI) card, passport, secondary school certificate, or hospital birth record or certificate is required, or d) Certification regarding NGO worker authorized by registrar in favour of date of birth, or e) Attested copy(s) of other document as prescribed by the Registrar.
2	<p>An informant or applicant can apply for registration in three different ways as such:</p> <ul style="list-style-type: none"> a) Manual: Forms are available in registrar office. Parents visit the registrar office, collect manual form and properly filled up form along with supporting documents, then submit it. b) Online: The applicant can fill up online form from anywhere if computer and internet facility are available and then take a print out. Also, Union Digital Centres helps to fill up the form and print submitted copy. c) Hand written: Citizen can even apply with a hand written application where all necessary information has been written correctly.

Continuation of Table 10

Step	Process
3	An applicant has to take the hard copy of the manual form or the printed copy of the online form, or the handwritten application with him/her and then attach the supporting documents with the form. Then the applicant submits the form to the office of the Registrar by local government, for example: Union Parishad, City Corporation, Municipality and Cantonment Board. The office must be within the same jurisdiction of the Applicant's permanent address, present address or place of birth.
4	After receiving the submitted form the assigned person in the Registrar office reviews the application form, verifies the supporting document(s) and then calculate fees if needed.
5	If the supporting forms are not correct or the form found incomplete, then registrar officer asked the applicant to visit the registrar office again with correct document.
6	If all the documents are alright, the assigned person checks whether the date of birth is less than 2 years. If less than 2 years, the application is sent to the IT officer for further processing without charging any fee. If the date of birth is more than 2 years, the registrar office charges according to the fee schedule. After paying the fees, the applicant receives the receipt of payment.
7	The application is sent to the IT officer for further processing. The assigned person and IT officer can be the same person.
8	IT officer first checks the type of the application. For manual form or handwritten application, IT officer gives the entry to the online BRIS according to the form or application. Then asks the applicant to check if all the entries are alright.
9	For online application, IT officer takes the printed copy and re-check the data entry and verify the data.
10	After entering or verifying all the data, IT officer checks for duplicates with and if no duplicate is found, IT officer approves the new registration.
11	After that, IT officer completes the data entry in local registrar and BRIS system. The inserted data are then stored into the BRIS central database.

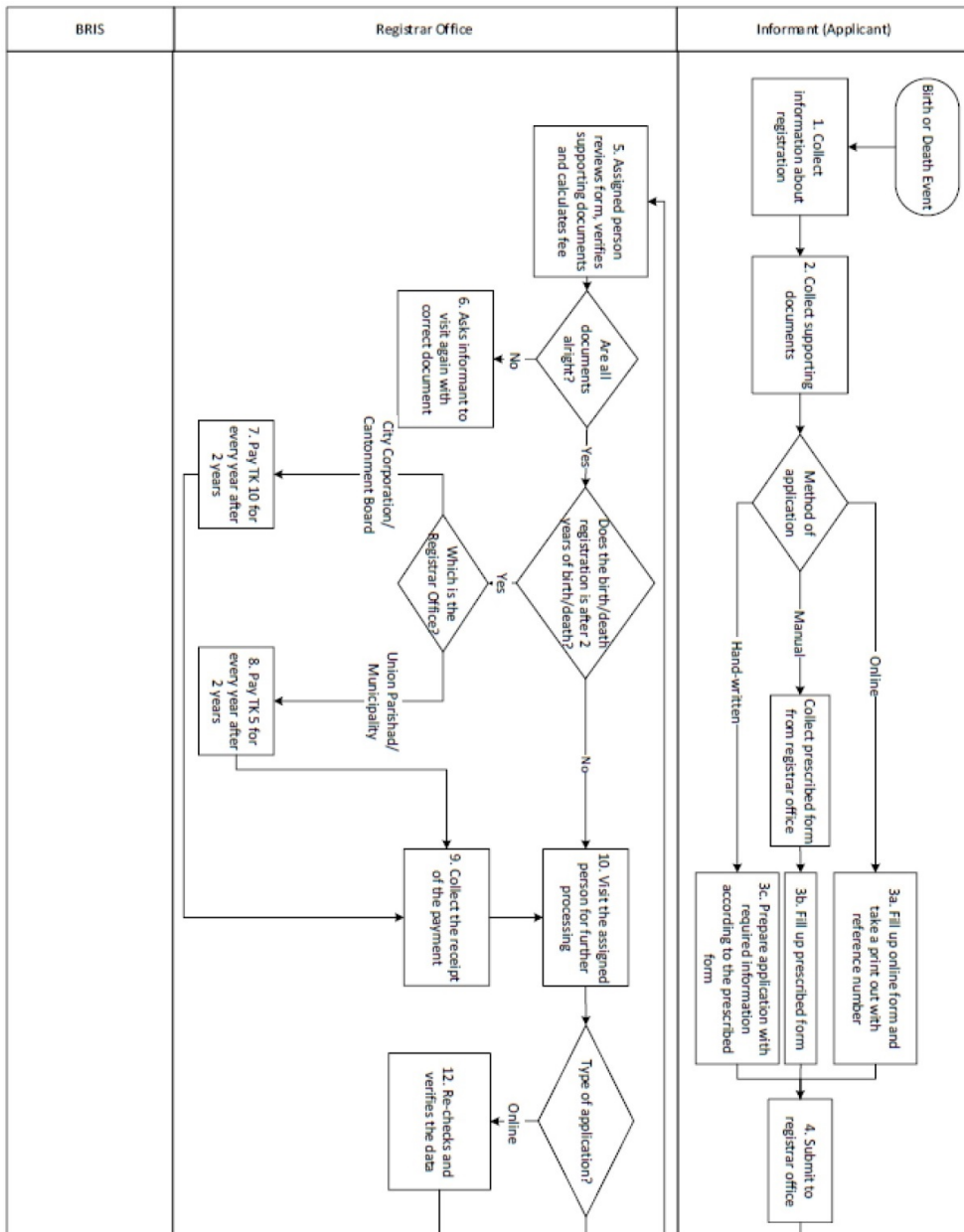


Fig. 5 Birth Registration Process (cont'd. next page)

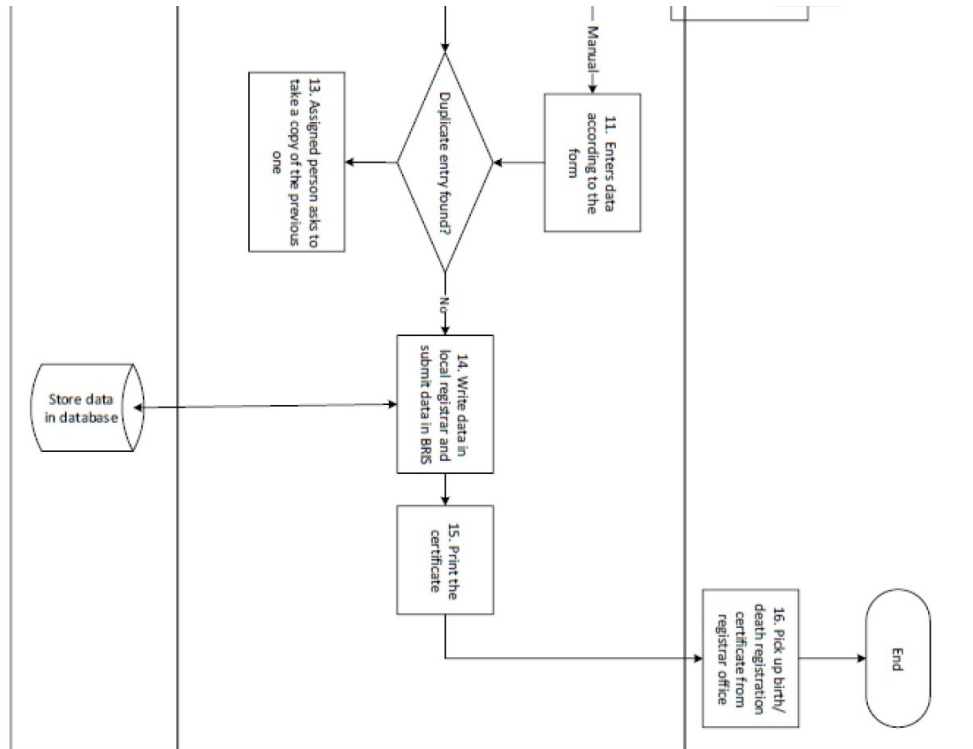


Fig. 6 Birth Registration Process, cont'd.