

Caste prejudice and infection: why a dangerous lack of hygiene persists in government hospitals
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In light of India's continuing efforts to reduce maternal mortality and make childbirth safer for women, this article explores why government hospitals continue to be dangerously unhygienic, posing serious risk of infection to patients in maternity wards and labor rooms. Through interviews with cleaners and other health staff, and observations at district level hospitals and PHC/CHCs in Uttar Pradesh, Bihar, and Madhya Pradesh, we find that unhygienic practices and behaviors by health staff abound, leading to an environment with high potential for infection. Deep caste prejudice against cleaners, who continue to come from marginalized Dalit communities, prevents the professionalization of their work. This, in turn, leads to a lack of hygiene as casteist notions of what is clean and unclean influence the way that infection is understood and infection control is implemented. The discrimination cleaners face means that they are the least trained and least supported hospital staff, overburdened and underequipped to maintain the high standards of hygiene required to promote patient wellbeing. Rather than addressing these deeper issues, antibiotics are routinely prescribed as a shortcut to dealing with the risk of hospital infection, potentially contributing to increases in antibiotic resistance in the long run.

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Despite progress in reducing maternal mortality in recent decades, India represents one-fifth of all maternal deaths. At 45,000 deaths in 2015 (World Bank 2015), this is more than any other country in the world. India's 2015 maternal mortality rate (MMR) was 174 per 100,000 live births (World Bank 2015a). In contrast, India's neighbors, China and Sri Lanka, had MMRs of 27 and 30 respectively. Developed countries, like the United Kingdom and the United States, have MMRs below 15.

Indian health policy has increasingly emphasized hospital births as a means to reducing maternal mortality. Based on the assumption that hospital births are cleaner and safer than home births, India's Janani Suraksha Yojana (JSY) has provided cash incentives to encourage women to deliver in public hospitals since 2005. As hospital births have increased from approximately 40% to 80% of all births from 2005 to 2015 (NFHS 2015-16), the program is often touted as a great success. Still, India's MMR remains high.

Sepsis, or infection, is a leading cause of maternal mortality in India, and is additionally associated with various morbidities (Hussein et al 2011, NHP 2016). Post-partum infection indicators in national level data (NFHS 2015-16) show that about one-fourth of women who delivered in a government facility in Uttar Pradesh, and close to one-fifth of women in Bihar, reported high fever within 40 days after delivery. A 2015 study in Uttar Pradesh found cases of puerperal sepsis, or infection from childbirth, both among women who delivered at home and those who delivered at hospitals (Qadri 2015). It is likely that the additional women brought into the hospital system by JSY is putting pressure on public facilities that they are not equipped to handle, resulting in falling standards of care and increased risk of infection (Hussein et al 2011), thereby diminishing some of the advantages that an institutional delivery might offer over a home delivery.

The deficiency of sanitation infrastructure and maintenance in government hospitals in India is well documented (WaterAid 2016). Various studies and experts have reported that rates of hospital acquired infection are concerningly high in India (GARP 2011, Mehta et al 2007). This direct link between basic hospital cleanliness and hospital acquired infection is in some ways straightforward to address, and indeed, government programs like Kayakalp, have begun to “incentivize and recognize public healthcare facilities that show exemplary performance in adhering to standard protocols of cleanliness and infection control” (NHP 2015). However, the government’s checklist tends to prioritize what can be plainly seen, relying largely on visual inspection, checking of documents, and staff reporting to make assessments. Only a handful of items on the checklist ask reviewers to observe health workers. This means that as long as documents are in order, and staff are trained sufficiently to know the correct answers to give, behaviors that may transmit infection can be largely neglected, while cosmetic cleanliness can earn a facility a glowing review. Our analysis revealed much deeper and more difficult problems to solve.

Although some studies in India have examined the effectiveness of specific interventions to improve adherence to hygiene protocols in hospitals and labor rooms (Shouri 2017, Biswal et al 2014), few have sought to understand the range of behaviors and beliefs that prevent high quality infection control. Through qualitative interviews with cleaners and other hospital staff, and observation of government hospitals in north India, this study reveals how cultural beliefs misinform understandings of how disease is spread. It also shows how internalization of caste prejudice perpetuates dangerous medical practices in hospitals. We find that, in addition to a widespread lack of understanding of infections, rampant caste discrimination prevents professionalization of the cleaning staff. Since they are most directly responsible for keeping facilities clean, caste discrimination leaves hospital patients gravely at risk.

Rather than addressing these deeper issues of prejudice among health staff, we found ubiquitous use of antibiotics for mothers as a shortcut to prevent infection while they are in the hospital. This practice falls outside WHO recommendations (WHO 2015), and incorrect usage of antibiotics is likely to lead to serious antibiotic resistance.

Hospital hygiene and infection control are issues that draw serious attention and resources in developed countries but are not given enough consideration in health policy discussions in India where inferior infrastructure quality and overcrowding make conditions far more unsafe. This article asks why, even though Indian officials have begun to recognize that hospital acquired infection is a problem, hygiene in government hospitals is still so abysmal. As more women turn to health facilities to give birth, it is imperative that the potential infection risks posed by hospital births be more widely discussed.

Hospital birth, infection, and maternal mortality

India’s overall maternal mortality rate of 174 per 100,000 live births masks great variation within the country: following the trend of many other human development indicators, northern states have much higher rates of maternal death (above 150) than southern states (below 70) (SRS 2018). This study focuses on the role that hospital hygiene and infection may play in India’s high rates of maternal mortality in northern India.

Table 1 shows trends over time in place of delivery and post-partum infection for vaginal births in 2005 and 2015 in select south and north Indian states from nationally representative National Family Health Survey (NFHS) data. Our study's focus states are in north India, and include Uttar Pradesh, Bihar, and Madhya Pradesh (left side of table). Kerala and Tamil Nadu in south India (right side of table) provide a comparison. While post-partum fever cannot be directly measured, since women are not systematically tracked after delivery, reports of high fever in the 40 days after giving birth are a strong indicator of infection. It is important to note, however, that rates of infection are likely underestimated. This is true for multiple reasons: we only have data on a single symptom, our analysis only includes vaginal deliveries and not c-sections, and, self-reported numbers may undercount actual instances.

Facility births have increased drastically in the north Indian states. Surprisingly, infection rates have also gone up over time in all settings (public hospitals, private hospitals, and at home). It is possible that women are more aware of their symptoms (like high fever) after birth, or that survey data quality improved for this question. Also, this data does not tell us whether women's infections originate in the hospital itself, or after being discharged from the hospital because their home environments are unhygienic. Still, women delivering in hospitals should both have a cleaner birthing environment than those delivering at home, and should be given information from hospital staff to help prevent infection after going home. These increasing infection fractions, therefore, suggest a lack of adequate care. Further, it is clear that in the south Indian states, rates of infection are lower. Better outcomes are possible in India.

Table 1. Place of delivery, rate of infection, and maternal mortality for vaginal births: Uttar Pradesh, Bihar, Madhya Pradesh, Kerala, Tamil Nadu

<u>place of delivery (NFHS)</u>										
	UP		BIHAR		MP		KERALA		TN	
	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>
govt	6%	47%	3%	50%	18%	72%	38%	41%	51%	75%
private	11%	18%	14%	12%	6%	7%	61%	59%	33%	24%
home	83%	35%	83%	38%	76%	21%	0.9%	0%	15%	1%
<u>infection after delivery (NFHS)</u>										
	UP		BIHAR		MP		KERALA		TN	
	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>	<u>2005</u>	<u>2015</u>
govt	15%	23%	18%	21%	15%	17%	6%	8%	4%	13%
private	16%	19%	20%	20%	12%	13%	5%	6%	3%	13%
home	19%	25%	21%	22%	17%	20%	0%	0%	5%	13%
<u>maternal mortality (SRS)</u>										
	UP		BIHAR		MP		KERALA		TN	
	<u>2004-2006</u>	<u>2014-16</u>	<u>2004-2006</u>	<u>2014-16</u>	<u>2004-2006</u>	<u>2014-16</u>	<u>2004-2006</u>	<u>2014-16</u>	<u>2004-2006</u>	<u>2014-16</u>
mmr (deaths per 100K live births)	440	201	312	165	335	173	95	46	111	66

Methods

We selected districts in Madhya Pradesh, Bihar, and Uttar Pradesh based on high population numbers and high maternal mortality rates. Within selected districts, we visited the main district hospital, and at least one Primary Health Center (PHC) or Community Health Center (CHC) within that district. We purposely selected health centers that were easily connected by road to the main district hospital to see the places where medical supplies and staff are most likely to reach.

Based on the size of the facility, we spent between three and six hours per hospital. While in the hospital we interviewed staff and observed their behavior. We also observed the general condition of hospital wards and grounds. We looked for items such as whether the floor was visibly clean, whether a sink was available for staff and for patients, whether waste was visible in the corridors, if bedsheets were clean, if toilets were clean, if staff were wearing gloves while interacting with patients, if gloves were changed in between patients, and if staff washed hands before and after interacting with patients.

Out of 55 interviews, 26 were conducted with cleaners, using a question guide to direct the conversation. Topics of inquiry included job responsibilities, challenges while working, existence and enforcement of cleaning procedures, including glove use, floor and latrine cleaning, sheet changing, and needle and biowaste disposal, knowledge and understanding of infection and infection control policies, nature of interactions with other hospital staff, job-related health concerns, and family work history and aspirations. Remaining interviews were conducted with cleaning staff supervisors, ward attendants, dais, ayahs, dhobis, lab technicians, nurses, doctors and hospital administrators. A breakdown of interviews by state and facility type is given in Table 2 below.

Table 2. Count of interviews by state, facility type, and hospital staff position

	cleaner	cleaning staff supervisor	ward boy	dai	ayah	dhobi	lab technician	nurse	doctor	hospital manager/health manager	total
MADHYA PRADESH (August, 2016)											
district	3	1			1			1			6
phc/chc	4						2		1		7
medical college											0
BIHAR (March, 2017)											
district	6	1	2			1		1		2	13
phc/chc	2							3	1	2	8
medical college	2						1		1		4
UTTAR PRADESH (April, 2017)											
district	7	1			2			1			11
phc/chc	2			1				3			6
medical college											0
TOTAL	26	3	2	1	3	1	3	9	3	4	55

Under the surface

While facilities often look clean at the surface, many unhygienic practices by hospital staff, informed by a cultural understanding of what is clean and unclean, are likely spreading germs and causing infection. These same beliefs are also at the root of caste discrimination against cleaners who are responsible for maintaining hygiene in hospitals, putting the cleaners themselves at great risk, and in overstressing their capacity to do their jobs well, putting patients at risk also. In this section, we describe the conditions and practices we found in maternity wards and delivery rooms of government hospitals in Madhya Pradesh, Bihar, and Uttar Pradesh.

Inside the delivery room. Today, the germ theory of disease is common knowledge, and medical guidelines for maternity patients ubiquitously include glove use, handwashing, and instrument cleaning as standard protocol. And yet, across multiple delivery rooms, across multiple states, stories abound of behaviors that are serious cause for alarm.

In a delivery room of a district hospital in Bihar, a senior nurse performed two consecutive vaginal exams with the same glove, minimally running water over the glove in between. She also did not wash her hands before or after these examinations. In a district hospital delivery room in Uttar Pradesh, a nurse inserted an unsterilized sari cloth into a woman's vagina to remove remaining placenta from the womb. In another district hospital in Uttar Pradesh, where many women were delivering simultaneously, an ayah removed metal instruments from water in a rusty metal container with her bare hands. And at a smaller CHC in Uttar Pradesh, a nurse mentor explained that before 2016, instruments were routinely cleaned with just water, though now they use bleaching solution. In reality, even this is not enough, and washing, boiling, and autoclaving instruments regularly are standard protocols for instrument sterilization (ICMR 2016).

Outside the delivery room. Unhygienic conditions and practices outside the delivery room were also far too easy to find. The toilets in several maternity wards had not been cleaned in several days. At both district and PHC/CHC levels, toilets were sometimes filled with feces, leaving women no option but to squat above the feces in the pan, or to go out in the open. Although cleaners are responsible for daily cleaning of toilets, there is a mix of shirking of responsibilities by cleaners who are unwilling to handle feces, and a lack of time for cleaners who are doing tasks beyond their own duties.

Several cleaners who worked in delivery rooms and maternity wards mentioned that they are responsible for changing dressings for women post-delivery, and for inserting and removing catheters, both of which put them in contact with patients' open wounds. In the maternity ward at a district hospital in Bihar, a cleaner did not wear gloves throughout her shift, as she swept and mopped the floor, went in and out of the delivery room, and washed the latrine with water. Before leaving, she wore gloves and removed a patient's catheter, discarding it out the window along with the gloves. Catheter removal is the responsibility of trained nurses, not cleaners. Additionally, since gloves can have holes or break, the cleaner's lack of hand washing prior to patient contact is a health risk for the patient.

As we walked out of the hospital, three nurses outside of the general ward were filling in many syringes from identical bottles (we learned that they were antibiotics). One nurse had just walked out of the nurse's toilet, without washing her hands at the sink outside the door. The three nurses then began administering the injections with no gloves on, neither washing hands nor using sterilizer between patients.

Such unsafe behavior clearly puts staff, patients, and attendants at risk of infection. So why don't hospital staff follow procedure? Many of the reasons described below appear at the outset to be logistical. However, they oftentimes stem from cultural understandings of cleanliness that do not align with medical best practice, and go unnoticed because they most directly affect low-caste cleaners who are believed to be unimportant, and whose work is seen as unclean.

Why a lack of hygiene persists – the unseen role of casteism

In his 2007 book, *Better*, American doctor Atul Gawande describes the meticulousness with which his US hospital tried to address hospital-acquired infection rates. Although a proper hand washing regimen is time consuming and difficult to adhere to, even switching to alcohol sanitizers failed to improve incidence of infection, which he attributes to holes in compliance rates. This is true in Indian hospitals also. However, in India, we argue that notions of purity and pollution and systems of hierarchy that stem from casteism additionally contribute to the risk of hospital-acquired infections. These beliefs are often at odds with the germ theory of disease, and negatively impact how hygiene is maintained in public hospitals.

Indian society has long been regulated by the caste system in which individuals are designated to particular occupations and ranked accordingly. Those of the lowest castes, or Dalits, are relegated to the most menial tasks, often those considered the dirtiest, such as cleaning feces and garbage, handling animal carcasses, preparing dead bodies for cremation, and cleaning after child birth. Their engagement in these tasks is used to justify widespread oppression and discrimination against Dalit communities. The types of discrimination they face are wide ranging, and include not being allowed to share water sources, not being able to go into temples, not being allowed to sit down in front of higher caste individuals, and not being allowed to enter police stations (Shah et al 2006).

In the hospital setting, even though the health facilities we visited were in urban or semi-urban places, cleaning work continues to be assigned to the same marginalized communities that exist in villages. Although we sometimes heard that people from other castes now do this work, we were unable to find any non-Dalit person in the role of a cleaner. Further, interviews showed clearly the intergenerational continuity of cleaning work: a majority of the cleaners we spoke with mentioned that others in their family, both in older and younger generations, did or do similar cleaning work, if not at the same hospital, then at another hospital, in another government office, in the Nagar Pallika, or in the Railways.

The stigma around cleaning work is still strong: cleaners explained that while people of non-Dalit castes are in cleaning work, they often refuse to do the dirtiest work of cleaning blood and latrines, and only actually do sweeping and mopping. At a CHC in Bihar, a health manager explained that the tradition of

certain types of workers, like dais from the Chamar caste and barbers from the Nai caste, has been going on since the Vedic period. A district hospital manager in Bihar explained that many cleaning jobs stay vacant because “normal” people “naturally” would not want to do this work, and only those of a certain caste are willing to take the jobs. Their explanations demonstrate the complete internalization of the hierarchical social order.

When asked directly about the discrimination they face in their work, cleaners mostly denied that it happens. However, caste discrimination is disguised in the form of an internalized hierarchy in the hospital institution, and both upper and lower caste people act according to tacitly understood rules of power. For example our attempts to speak to cleaners were sometimes met with outright hostility because many staff and administrators seemed to believe that cleaners were not worth talking to and were offended by how much attention and importance we were giving them.

Another manifestation of the hierarchy can be found in day to day interactions, in which cleaners know that they are never supposed to sit in front of their high-ranking, upper-caste superiors. A cleaner at a CHC in Uttar Pradesh explained that they cannot sit at the same level as other staff, even if there is a chair available. A cleaner at another CHC in Uttar Pradesh described how decades earlier, when he came for his job interview, he sat on the floor and touched the feet of his interviewers to show that he was as small as they believed him to be. He explained that only by giving sufficient respect to the higher-caste people in charge are people of low-caste able to get anywhere. He described that older cleaners pass down the rules to newcomers as they join the staff, making sure that norms stay intact and that hierarchy is maintained:

We follow the path that our elders lay out, because we are not going to go in a separate direction from them. If they showed us the wrong way, then we will go that wrong way.

These sentiments were echoed by many of the cleaners that we spoke with. Based on their life experiences, they understand the negative consequences of a Dalit breaking social norms. While they may not face physical violence in the hospital setting, there is always the threat of losing their job.

This internalization of prejudice is similarly seen among those perpetrating the discrimination. Non-cleaning staff, of higher caste, openly admit to the discrimination, and justify it. Using circular logic, a nurse at a CHC in Bihar explains that there is a distance because this distance has existed for so long:

This is Bihar, and there is a greater adherence to tradition here, as in this has been going on for a long time, people have been divided. For example, they shouldn't come [and sit in this room] here. We should not eat with them. Since this has been going on for so long, one doesn't get satisfaction unless we follow the rules. They are also not clean, and so the distance remains.

Unfortunately, the rules of caste hierarchy supersede those of a normal, professional, workplace. Rather than doing what is best for patient health outcomes, the dictates of caste take precedence. In

the next sections, we explore how caste prejudice impacts the work of achieving and maintaining hygiene in public hospitals, and some reasons why unhygienic conditions and practices persist.

Overcrowding. One of the most consistent sights in large district hospitals is the crowd. Patients often bring several attendants with them, and hospitals must cope with many more people than they were designed to handle. In one district hospital in Madhya Pradesh, 114 patients were crowded into a space that had 62 beds. This staggering number does not even count the multiple attendants that accompanied each patient. In some cases, attendants were sharing mattresses with patients. This volume of people exponentially adds to the physical filth that is generated, making cleaning difficult.

There is a stark contrast between the overcrowding seen in larger facilities and the relative emptiness of PHCs and CHCs. Efforts to get PHC/CHC level facilities functional have been unsuccessful, as seen by how empty they are. People know that larger hospitals have better facilities and more staff, and will be open at night, so rather than complaining about non-functional PHCs/CHCs, people opt to go to district-level hospitals, further overcrowding them.

Lack of respect. Because of the assumption that cleaners will ultimately clean everything up, there is often a general lack of concern about keeping public spaces clean (Gatade 2015). This assumption relies on the normalization of caste prejudice, so that the dehumanization of Dalits seems commonplace. Many cleaners complain about the lack of courtesy that families show. A cleaner in a Bihar district hospital explained that every patient brings 10 people with him/her, and that they do not cooperate when cleaners ask them to keep things clean. Another cleaner at a district hospital in Uttar Pradesh explains:

Lots of people throw [their garbage] on the floor. [If I ask them not to] they get angry and tell us to do our job [of picking up the trash]. They just throw it.

Hospital staff also assume that cleaners will pick up after them. Waste segregation systems in the form of different colored bins exist in many wards and delivery rooms. In some cases, health care staff use them diligently. But they are often undermined by carelessness and lack of respect for cleaners. Sorting through the trash and separating it into the correct bins then becomes another responsibility for the cleaner. Cleaners do not feel they can push nurses to follow the rules, as it is not their place. A cleaner at a Bihar CHC explains:

What can we say, what can we say to the nurses? They are above and we are below. If someone is higher up in the hierarchy, they can throw things anywhere, and they do. We just clean as we were told.

Hierarchy prevails, and lack of respect, both from patients and hospital staff, add to cleaners' workloads, making the hospital environment difficult to keep truly clean.

Shortages, of training, time, and supplies: The few permanent cleaners that we met had attended some training, though not necessarily at the beginning of their career. However, a majority of cleaners

we spoke with were contract employees, and none had ever received any formal training. Whatever they knew how to do, they learned by watching other cleaners. This is in part because cleaning jobs are not considered important enough to warrant special training, and in part because it is assumed that anyone from a sweeper caste who takes these jobs already knows what to do. As a cleaner in Bihar explains:

What training? I'm being open here. We are of a low caste, and from childhood we have been doing this work. You can see this as a training. We have been doing this work since we were young, and what better training than this could there be.

When training happens, it is not always given to the right people. At a CHC in Madhya Pradesh, a lab technician explained that the technicians are the ones who are sent for any government training (in fact, under the Kayakalp initiative, it is the lab technicians who are responsible for infection control in hospitals). They are taught about proper cleaning practices and procedures, and are supposed to train others. But the lab technician admitted that it is difficult to communicate everything accurately and in detail to the cleaners, implying that low-caste cleaners are not intelligent enough to understand the details of technical trainings.

Even without training, the list of tasks that cleaners are responsible for is long, and ever growing. It is commonly understood that officially, they are responsible for what is "below the windowsill." For cleaners in the wards, this includes taking out the trash, sweeping and mopping the floors, and cleaning latrines. For those in the delivery room, tasks additionally include cleaning blood off of sheets, mattresses, and beds, and removal of the placenta to an outside location. Unofficially, however, workers at all levels aspire to do the work of their bosses, and so task shifting, in which cleaners help those above them in the hierarchy with many of their assigned tasks, is common. Thus cleaners often change sheets for ward boys or ayahs, clean and dress infected wounds for dressers, insert IV lines and put in and remove catheters for nurses, and clean newborns fresh out of the womb for nurses or doctors. In some cases, they even deliver babies. While this gives their bosses some free time, the burden of these additional tasks comes at the expense of already overstretched cleaning staff. Additionally, cleaners are not trained to do the tasks of other staff, further putting patients at risk.

Conversely, even when there is too much cleaning work to be done, task shifting in the opposite direction is never done. A doctor in Madhya Pradesh explained that if he could not find a cleaner, "the dirtiness will stay". A cleaner at a CHC in Uttar Pradesh described how the delivery room sometimes stays dirty all evening and night because he is the only cleaner and he comes in the mornings to clean once per day. We were constantly assured by hospital staff and administration that there would never be a time when cleaning could not happen, because a cleaner could always be found if needed. Cleaning staff is given vacation only if other cleaning staff will be available to do the work. But more importantly, families and entire communities of cleaners commonly live together, so if one person is not available it is easy to find another. Repeatedly, we heard, "Only the sweeper will do the sweeper's work". A nurse in a Bihar CHC explains how there is no need for her to worry about doing cleaning work because cleaners manage within their own communities:

Here, whoever is the sweeper has her whole family with her, and they all live here. So if one needs help, another will come. Like those three... mother-in-law and her daughter-in-law take shifts, like that. They all live near. If there is an emergency, then all of them come. Among themselves, they manage.

Some nurses at a PHC in Bihar similarly explain that cleaners depute other cleaners (including their children) to finish their work if they can't do it themselves, but that the nurses themselves will not do the cleaning work under any circumstances:

They will delegate to someone. We can move the placenta, but we won't do any of the other cleaning work. We won't do it. At any cost. I'm telling you clearly.

One might argue that a separation of tasks is efficient. However, when cleaners are doing the work of others while no one is willing to do the critical cleaning work that keeps a hospital clean, the result is a lot of pressure on cleaning staff, with subpar results for hygiene.

This separation of tasks is understood by both cleaners as well as higher level staff. An ayah in a district hospital in Madhya Pradesh points out what each person's task is, and that it is the dirtiness of the work that determines what work she and other non-cleaning staff will and will not do:

[After delivery] The sweeper will clean with bleaching powder. We won't do that work, everyone's work is separate. Only she can clean, all the dirty work she will do, and we boil instruments, if the ward boy is present then he will boil instruments, nurses bring the cart with all the delivery supplies.

She goes on to say that if things are dirty, even the doctor will wait 10 minutes until things are cleaned. If there is no sweeper available right away, they will put gloves on both hands, wrap everything in a rubber sheet and put it on the side. If there is anything dirty on the ground, someone will use their feet to wipe it up. Then eventually they'll find a sweeper to do the cleaning because "only a sweeper can do this kind of work."

In addition to the infection hazards associated with leaving biowaste unhandled, the practice of task shifting is also problematic because it adds stress and work onto cleaners. Particularly at busy facilities, cleaners and other staff expressed feeling a lack of time when things get busy because there are only a set number of cleaners for so many patients.

Many cleaners admitted that when the delivery room becomes busy, rules for infection control are not always followed. A cleaner at a district hospital in Madhya Pradesh explained the impracticality of using gloves all the time:

When there is a lot of work, what can we do? Should we look after the baby, or pay attention to gloves, or to infection? So first, we hold the baby, and it sometimes happens that we're not able to wear gloves.

A health manager at a district hospital in Bihar explained that if someone comes from a faraway rural area for an emergency, it is difficult to tell the patient and her attendants to wait for instruments to be cleaned, and so rules sometimes have to be bent.

Additionally, supplies are also often lacking, forcing hospital staff to choose when it is necessary to wear gloves. Their decision rules mostly follow casteist notions of purity and pollution rather than germ theory. For example, gloves are required for traditionally "dirty" work, such as cleaning blood in the delivery room, or cleaning latrines which involves feces, but not required for tasks such as inserting IVs, doing jhadu/pocha, or handling trash, which are not considered polluting, though they can certainly expose a person to infection. Such rules leave gaping holes in efforts to strengthen infection control measures.

Hierarchy in the context of supply shortages prevents cleaners from asking for what they need to do their jobs well and safely. One cleaner in Bihar explained that she wears a glove only on one hand for each delivery, and then as per the rules, throws it away. She uses the gloves that are for the nurses, because the contract owner does not supply gloves sufficiently. Many cleaners mentioned that it is often difficult to ask nurses for supplies, and that nurses give gloves only for the tasks they do not want to do themselves, not for the cleaner's protection. A cleaner in Bihar also described how cleaners like him are too afraid to ask for protective gear that they are legally entitled to because they might be seen as insolent, and fired:

There is no one who is willing to speak. You must understand, if I speak up then they would think I am being an activist, and I would be the first to go, to be fired. Out of fear, no one speaks. If we do say something, they will say – punk, are you trying to be a leader? Let's get rid of him. Knowing this, no one says anything. Whatever they give us is fine.

This disempowerment allows rampant corruption because low-caste cleaners are largely invisible in the eyes of the government, and therefore easy to exploit. We met more than one cleaner who was expected to perform their duties without pay, and since most cleaners are hired on contract, many are severely underpaid. And contractors across all three states are not in compliance with regulations for providing cleaners with the protective gear they need and are legally entitled to. Despite these challenges, cleaners continue to make do without, at the expense of their own health, and of infection control and patient wellbeing more generally.

Beyond checklists and antibiotics: Wo sirf sweeper nahi hai

In light of India's continuing efforts to reduce maternal mortality and make childbirth safer for women, this article sought the perspective of cleaners to explore why government hospitals continue to be dangerously unhygienic. We find that unhygienic practices and behaviors by health staff abound,

leading to an environment with high potential for infection. Deep caste prejudice against cleaners, who continue to come from marginalized Dalit communities, prevents the professionalization of their work. This, in turn, leads to a lack of hygiene as casteist notions of what is clean and unclean influence the way that infection is understood and infection control is implemented. The discrimination cleaners face means that they are the least trained and least supported hospital staff, expected to undertake cleaning duties with insufficient supplies and protection, in addition to tasks for other staff members that they are unqualified to perform. This is the environment that mothers are encouraged and even paid under JSY to put themselves in, in order to deliver their babies.

Existing policies like Kayakalp use checklists that include direct observation of visible cleanliness: while outward cleanliness matters, it is not enough. In several locations, we noticed that after we began asking questions about cleaning practices, facilities would become spotless within hours. These transformations demonstrate an awareness of how clean a facility should be, and what is possible if implementation and enforcement of infection control is prioritized.

Several avenues for policy action seem useful. First, the casteist nature of hiring for cleaning jobs in hospitals must be discussed. Unless these jobs are adequately professionalized – with hiring of sufficient cleaning staff to match levels of overcrowding at many public facilities, enforcement of training for cleaners and supervisors, provision of adequate supplies and protective gear for cleaners, and respect - infection control practices will be impossible to follow. This will also require commitment from top hospital leadership to work with staff to reduce prejudicial attitudes and build better team dynamics, oriented towards achieving better patient outcomes.

Second, higher quality training is required for all staff to address gaps in understanding of infection and how personal behaviors matter. Hussein et al (2011) review evidence showing that educational interventions do have an impact on reducing infection, and there is much room for growth among Indian health care staff in terms of awareness about infection. And last, better data is essential. Tracking hospital-acquired infection is challenging even in rich countries, but India must start by at the very least systematically collecting data on postpartum infection and causes of maternal mortality. While prospective surveillance methods may be costly, Malhotra et al (2014) demonstrate how point prevalence surveys can at least provide useful information to prevent infection.

Unfortunately, the hospital staff and administrators that we met did not express serious concern about the public health implications of the lack of hygiene. Rather than fixing the deeper problems at the root of unhygienic practices (Chandra & Milind 2001), antibiotics are routinely prescribed to mothers and other patients as a shortcut to dealing with the risk of hospital infection. A nurse mentor at a CHC in Uttar Pradesh explained:

After delivery, one reason that antibiotics are given is because I do not trust that these instruments have been boiled well before use. To reduce chances of infection, we give antibiotics after delivery.

WHO guidelines state that routine antibiotics are not recommended for women with uncomplicated vaginal births, forcep or vacuum assisted birth, or episiotomies (WHO 2015), but all new mothers we

spoke with were given antibiotics after any kind of delivery. Many believed that antibiotic pills were for pain, unaware of the importance of following through with the full course, likely contributing to the development of antibiotic resistance. Several recent studies have documented growing maternal mortality from sepsis in the United States and the United Kingdom, and suggest that one possible cause might be growing resistance to antibiotics (Acosta & Knight 2013, Bauer et al 2013). A 2013 study from Madhya Pradesh (Sharma et al 2013) documented widespread misuse of antibiotics, and many studies have already documented evidence of antibiotic resistance across India (GARP 2011, INSAR 2013, Gopalakrishnan & Sureshkumar 2010, Tiwari & Sen 2006). A 2011 study from Karnataka found many antibiotic resistant bacteria in maternity wards and labor rooms (Manjula et al 2011). Antibiotic prescription practices in maternity wards should be studied further, as effective antibiotics are crucial for the improvement of maternal outcomes, and for the health of India's population more generally.

As the necessity for more judicious use of antibiotics grows, addressing the casteism at the core of India's hospital hygiene problem is even more critical. As Dalit communities are fighting fiercely to rid themselves of historical stigma associated with their responsibility for the dirtiest of jobs, dreaming that their children will no longer do degrading cleaning work, a silent public health disaster stemming from caste prejudice is on the horizon. Indian society faces a future in which no one is willing to clean. Cleaning work must be professionalized and treated with dignity, and more must be done to understand infection and infection control more accurately, so that patients do not have to suffer the health consequences of poor hospital hygiene. The lives and health of mothers, babies, and the population as a whole depend on it.

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