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## Living on Borrowed Breath: Respiratory Distress, Social Breathing, and the Vital Movement of Ventilators

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*Based on ethnographic research in a public hospital trauma intensive care unit in Mumbai, India, this article formulates the concept of “social breathing” to analyze how breath is central to values of life at the edges of death. Case studies of emergency resuscitation, intubation, and ventilation each illustrate breathing’s sociality, as people and machines move air both materially and immaterially. Amid the hospital’s rationing of life support technologies, forms of life that seem to be self-regulated are better understood as relational movements of breath. Social breathing stands to reshape our understanding of the biopolitics of intensive care by drawing attention to uncertain techniques of the body. These techniques move at the hinge between person and environment, self and other, public and private health care systems, and medicine and machine. Life’s valuation at this hinge takes shape through breath moving against its limits. Ultimately, the article argues that it is crucial to understand how ventilators mediate the edges of life and death by tracing the circulations of life support as the movements of life itself. As patients, families, and hospital workers struggle to make and manage breath, we might better grapple with the social relations that emerge as life support shapes life. [trauma, injury, breath, ventilator, life support, India]*

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### Dead, but Breathing

A ventilator stands by a man on a gurney in a public hospital trauma intensive care unit (ICU) in Mumbai. The man was hit by the local train while walking across the tracks. The senior resident wants to declare the man dead: “He’s gone (*ho gaya*), and I’m going to inform the family.” There is some discussion among the residents about the trains being late today and what to order for lunch.

The senior resident summons the man’s relatives. The doctors tried everything they could, he says, but the man’s heart kept stopping and he is no longer breathing. “But are there any chances he’ll recover?” the sister-in-law asks. No, the resident says, “He is no more” (*abhi toh nahin*). This is in the hallway. The resident leads them into the ward, where they take in the scene of plastic bins overfull with the

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Class	Per Day Charges	Bed Charges (included in Per day charge)
<b>SUSPECTED</b>		
Gen.Ward.(SS)	21,000.	3000.
ICU	32,000.	6500.With-Ventilator. 5100.Without.Venti.
SINGLE ROOM	30,000.	
<b>POSITIVE</b>		
Gen.Ward.(GH)	15000.	3000.
Gen.Ward.(SS)	21,000.	3000.
Twin Sharing	25,000.	
Single	30,000.	
ICU	32,000.	6500.With Ventilator 5100.Without Venti.

Figure 1. Tariffs for care. Source: <https://twitter.com/AnToJoseph/status/1262693107755126785>. [This figure appears in color in the online issue]

garbage of resuscitation. They see the ventilator, still attached to the man. His wife asks the same question: “But are there any chances?”

The ventilator beeps, and the sister-in-law points to it: “What’s that?” she asks of the signal (*yeh kya hai?*). The resident replies, “It’s the machine breathing.” This strange link seems to sink in; perhaps while nothing makes sense, something surfaces as true: Breathing but dead. Chest rising, but dead. Machine pumping, but dead. This is conjecture on my part, because I do not ever ask anything in these moments at the knife-edge of life and death that this ward both cares for and puts on display. “He was my only brother!” the sister-in-law exclaims. The two women stand by the man’s body, hold hands, and pray.

In her landmark study of intensive care and dying in hospitals, Sharon Kaufman notes that life support is surrounded by “several kinds of indeterminacy,” whereby the mechanical ventilator concretizes competing pressures of faith, individual determination, the potential heroism of medicine, and the hospital’s institutional logics (Kaufman 2005: 272). In the Mumbai trauma ward, the ventilator creates

indeterminacies by interceding in breath's circulation. It can trick people into closure and can twist language. I step away; the resident moves into the ICU, perhaps relieved that he had no more explaining to do, a release from the bonds of responsibility for this young doctor to explain to a family in shock why the very machine that breathes back life works, but only half-works really: It beeps and blinks and pushes air, but does not fully register its living partner. It is connected, and part of the circuit, yet life is not circulating. For me, this is an object lesson: Breathing is not necessarily a sign of living. Both are matters of circulation, and one does not guarantee the other.

The man's ventilator is still pumping.

When breathing is compromised, what shifts in the ways bodies turn air into breath? What kinds of breathing practices do people craft through life support technologies? And how do the social dependencies of bodily techniques reflect the biopolitics of respiration? In this article, I argue that one answer to these questions lies in approaching scenes of mechanical ventilation through a critical feature that I call *social breathing*. Breathing is social because people and machines move air both materially and immaterially, in times of distress. Social breathing is an example of a "social phenomenology," to use the term that Livingston (2012: 145) employs to think about how "every effort is made to socialize" the pain of cancer patients, often through laughter. Livingston demonstrates that the inner pain of bodies is social because it proves to be distributed in complex ways, even though "the biomedical technologies and techniques of palliation are sparse and put to uneven and uncertain use" (p. 150). In contexts of rationed life support technologies, forms of life that seem to be self-regulated also may be understood as relational flows.

Three different techniques of social breathing serve as case studies in this article and are its grounds for framing social breathing as a biopolitical intensity of intensive care. First, there are the movements of resuscitation through the handheld positive-pressure masks known as ambu-bags that kin squeeze to supplement necessary oxygen. Second, when ambu-bagging falters, there are the moves of intubation that introduce mechanical ventilation into the picture and cement the hopefully temporary and life-saving connections between humans and breathing machines. Third, there are the movements of weaning—i.e., removing someone from a ventilator. Communication about the fine line between recovery and the end of life happens here, as compromised lungs reach their limits of vital gas exchange. Relatives of ventilated patients formulate ethics of their kin, who cannot speak while on life support, sometimes speaking to them and sometimes speaking for them as wishes get worked out, in ways that may approximate breathing for them too.

Through resuscitation, intubation, and weaning, breath (*saans*) shuttles between patients and their kin, between patients and doctors, and between patients and machines. These bodily techniques deepen breathing's sociality. By "techniques of breathing," I draw on the principal concept of Marcel Mauss's essay "Techniques of the Body" (1973 [1935]), a work with significant effects on social theories of embodiment and medical anthropology more generally (Csordas 1990). One feature of Mauss's essay is notable here, and that feature is a gap: There is relative silence in the essay about breathing. Mauss assays a range of bodily practices, from swimming to eating to sleeping. Yet breathing is mentioned only twice, and briefly so. It is noted as a feature of rhythmic walking. Later, in the final lines of the essay, Mauss

mentions breathing as important in India, and speculates that “breath technique” can be ritualized (he is likely referring to *pranayama*, the yogic practice of breath control).<sup>1</sup>

While it is beyond the scope of this article to analyze fully why such a profound bodily movement like breathing seems incidental to Mauss, this does raise the question of what counts as a technique of the body and which conditions enable its sociality. There is a common thread of individuation, volition, and pedagogy to the techniques Mauss details. Techniques of the body may be taught, as in the case of teaching swimming; thus, bodily techniques become social because they intensify through what Mauss calls “tradition.” This claim to taught tradition allows Mauss to map specific techniques onto social groups writ large. Techniques of the body are taught, learned, and specific in this light.<sup>2</sup>

I make no claims on specific “Indian” forms of breathing here. Rather, I approach social breathing in contexts of respiratory distress as “techniques” because breathing on a ventilator calls into question several layered assumptions about breathing itself and about bodily techniques in general. Breathing *seems* deeply individuated, because it is mostly thought to be autonomic: Chests heave and nostrils flare, sometimes at will, often without thinking. Yet in contexts of respiratory distress, breath must move between people, and between people and machines. These movements illustrate the uneven distributions of care technologies (Pols 2012), the meaningful shifts in air, and the circulation of life at the edges of death.<sup>3</sup> Further, techniques of social breathing become evident through threats to life posed by injury and disease. Perhaps we do not normally see the “social” in breathing until the individual is struggling to survive. Differences in bodily events and circumstances matter for making sense of differences in bodily techniques. This means that bodily techniques are eventful and dynamic, and they are organic and machinic. It is differences in these technics of bodily techniques that index how breathing becomes social—differences that are subjective and structured by inequality at every turn. Airway interventions are bodily techniques set in distinct political–moral economies of both machine and human supports to patients’ lungs and physiologies.

My case study emerges from ethnography in an emergency trauma ward in a public hospital in Mumbai, India, that I call Central Hospital. Over 20 months between 2015 and 2020, I studied how traumatic injury from traffic accidents transforms life in public hospital settings such as Central’s trauma ward (Solomon 2017, under contract). The ethnographic vignettes in this article derive from those observations and interviews in and around the hospital and describe scenes of intubation and mechanical ventilation for respiratory distress. I initially conceptualized my research as a study of how the Mumbai trauma ward crystallized the often-injurious interface between the body and mobility in urban India. But writing the research results during the Covid-19 pandemic reveals certain insights that circulate beyond the Indian context (while still affecting them acutely). At Central, rationing ventilators is the norm and not the exception. This may not have been true for most of the Global North prior to early 2020. But at present, the clinical necessity for rationing ventilators makes the issues this article explores a stark reality across the globe. For good reasons, the possibilities for ethnography in clinical spaces at present is limited. Yet it is nonetheless valuable to reflect on the social dynamics of ventilation from existing data on the intensities of intensive care.

The ward I study is meant specifically for trauma cases (i.e., for patients who have experienced blunt or penetrating life-threatening wounds). But despite the *cause* of their hospitalization, which is primarily road and railway accidents, one of the many sequelae of traumatic injury—especially chest trauma—is respiratory distress. Trauma patients frequently develop acute respiratory distress syndrome (ARDS) and pneumonia (Treggiari et al. 2004; Watkins et al. 2012). These connections between compromised breathing and organ failure make breathing a focus of care and survival amid trauma. Consequently, this article engages breathing as a critical practice, and examines the movements of care and damage that mechanical ventilation poses. I trace the ICU's breath-centered economies of survival to understand the rationing of medicine in clinical contexts (Nguyen 2010). I do so through the framework of the breath's relational movements around and through the ventilator. A framework based in movements addresses the fraught relationality involved in ventilation in ways that frameworks premised on individual choice do not. Choosing who will live and who will die based on ventilator availability is part of the story, but the accounts I analyze here show that choice is a problem of circulation, and that the ethics of ventilators are anchored in matters of social breathing.

The article's next section situates the ventilator in the context of the uncertain interface between distressed breathing, rationed technology, and atmospheric environments in Mumbai. Then, I delineate the specific technosocial practices entailed in breathing support, especially ambu-bagging, intubation, and suction, to clarify the incremental and intimate acts that make ventilation possible. The section after that describes the desires and dilemmas associated with the ventilator's removal. In the final section, I reflect on how the biopolitics of social breathing may be understood as a matter of moving relations.

### Breathing through Mass Distress

The trauma ward at Central Hospital has 14 beds; often, only nine or 10 mechanical ventilators are working, and the remainder are under repair. The death of one patient on a ventilator means the possibility of ventilator support for another person. These movements from the dead to the still living, and from giving up hope to providing it, can all happen quickly in the ward's complex ventilator economy. It is one of the basic tenets of the ward that there are not enough ventilators to respond to the demands of trauma cases. The patients who come to Central are mostly poor, and their presence in a public hospital rather than a private facility marks the ways they already inserted into economies of inequality in other domains of life. This makes facing inequality again in moments of brittle breathing all the more injurious and all the more insulting. There are economies and circuits in the ward itself, too, locally and beyond. India's present euthanasia laws require that once placed on a ventilator, patients must stay on until they are able to breathe on their own, or until they achieve death while being made to breathe. Even if the family wishes for life support to be withdrawn, doctors cannot do this. Put simply, doctors are not the arbiters of a ventilator's availability because they do not make the sovereign decisions of the machine's on or off switch. Only a dead or recovering patient can make the machine available for another person. Ventilators circulate agency in this way and distend its individuation.

The ICU trauma ward's principal aim is to treat blunt and penetrating wounds that are immediately life-threatening. But like many intensive care settings, the ICU demonstrates features that may be generalized across cases of mechanical ventilation. Writing on this context of rationed breathing in 2020 from the United States, it is challenging to address mechanical ventilation for *any* clinical problem without some connection to the ongoing coronavirus crisis. While my case study in India is not Covid-19, there is much that resonates with the ways that the virus compromises breathing globally in the context of the coronavirus pandemic. Clinically, Covid-19 patients may develop a cough, difficulty breathing (dyspnea), and pneumonia, and may experience diminished oxygen saturation. Different forms of breathing support are often required, some more invasive than others, and mechanical ventilation may be more damaging than therapeutic.<sup>4</sup>

In this mix of the ventilator as a necessity, as an ally, as a therapy, and as a potential enemy—all in the same frame—life itself gets rendered through the circulation of normalized breath. This is especially evident in ICUs, where critical care and pulmonary medicine confront the organic effects of novel coronavirus: toughened lung tissue, fast-paced pneumonia, and ARDS. Coronavirus is materializing the limits of breath and is situating ventilators between the domains of the individual and the collective (and in the United States, the shift in public debate from the ventilator to the mask as a critical site of politics reflects this social in-betweenness of breathing). In some settings early in the pandemic, ventilators connected patients, as doctors experimented with ventilating multiple patients on one machine. Hospitals and states developed protocols for rationing ventilators based on the number of possible years a patient might live if they receive the ventilator, in contrast to someone else (Kaufman 2005; White and Lo 2020). But what determines the bounds of breathing in these contexts?

### Breathing Room

The ICU at Central inhales the city: It is impossible to bound air, to stop it at the ward's portals. Air's circulations constitute and threaten social breathing. One afternoon I walk into the resuscitation area, also known as "resus." It's separated from the ICU by a swinging door. It's May, and it's scorching outside. Monsoon has not yet reached Mumbai. The air quality index in the city has measured in the zone of "unhealthy" for a while now, and only monsoon will bring relief. The ICU has high-blast air-conditioning. The resus area does not. Newly arrived patients often shiver and complain of being cold, a common symptom of shock, so it's warmer in here. It is not uncommon for staff to pop into the ICU just for a little A/C.

Anil, the ward's head ventilator technician, points out some blacker spots on the ceiling corners: mildew. The climate makes it difficult to dehumidify the room, especially with the doors opening and closing all the time. Intensive care demands the motions of medicine, but air flows as bodies move in and out of the room's doors. The design of the HVAC makes sealing things off simply impossible. A decade back, they fumigated the ICU and shifted the patients elsewhere for safety, but even after the patients returned, one of them got sick from the lingering fumes and died.

The fantasies, failures, and successes of controlling air's circulation underlie the history of ventilators.<sup>5</sup> Intensive care medicine's own disciplinary history may be

tracked through developments of seals and vacuums, from the iron lung to the tracheostomy (Baskett and Safar 2003; Lock 2002; Safar 1996; Tercier 2005; Timmermans 2010; Weil and Tang 2011). In India, ICUs began as coronary care units in Mumbai (one at a public hospital, and one at a private hospital), and these units later developed a focus on critical care for respiratory distress (Prayag 2002; Yeolekar and Mehta 2008). Technological shifts heavily influenced what would count as a modern ICU. As Margaret Lock (2002) details, the development of artificial respiration (“breathing machines”) entailed different types of machines, and, in turn, different types of bodily envelopment and force over time. First, there was the iron lung of the 1930s that encased the bodies affected by polio, which allowed the lungs to expand by applying negative pressure on the chest. Later iterations of the iron lung appeared in the 1950s and their descendants today are called “ventilators” and stand at the bedside, monitoring breathing as they intervene on it. A tube down the throat replaces the body in the machine. Positive pressure replaces negative pressure. The machine is inside the breather, rather than the other way around. But changing the mechanics of air flows is only part of the problem. As life support technologies become normalized in wealthier settings (including in private hospitals in India where they are much more available than in public hospitals like Central), ventilators pose the problem of ordinariness, whereby moving on and off the machine can set the terms of medicine writ large (Kaufman 2005).

A key feature of ventilators that remained relatively unmentioned in coronavirus-related discourses is that ventilators are complex machines that require trained professionals to operate. It can be tempting to focus solely on the machines in calls for increasing their supply. But this may elide the machine’s maintainers, to use Russell and Vinsel’s (2018) term for the central role of technological upkeep in a society that connects industrial histories to social stratification, whereby certain occupations become essential for the thriving of other bodies. Simply put: There is critical but relatively invisible labor involved in making social breathing work because the machines require careful monitoring and repair.

In Central’s trauma ward, an engineer from the company that manufactures the ventilators is often present, working on the machines that have stopped functioning. One afternoon I watch him open up the body of the machine that has a piece of surgical tape on its top, where someone has written “NOT WORKING” in large letters. It is a box of many colors and shapes: wires, circuit boards, modules, and tubes. The engineer, a young man named Vikram, works quietly and with intense focus, between the beds of two patients each on (working) ventilators. A plastic glove is attached to the machine’s inspiratory line, inflating and deflating like a deep-sea creature. Vikram’s hands are deep in the circuit box. It always looked to me like he was performing surgery on the machines.

On his break, we talk. The first time he was sent to the trauma ward to repair ventilators, he felt confused by the scenes of injuries and fragility that each patient’s case presented. “I thought, ‘Where am I?’” he says. Conducting repairs *inside* the ward felt so removed from the work on machines that he does back at the company headquarters. He terms this kind of work *fieldwork*. Despite the disturbing feeling and sights of the trauma ward ICU, he feels that it is his duty as an engineer to fix the ventilators; after all, who else could do this? He proudly notes that he is “on call”—meaning that the doctors and nurses have his cell phone number and can call him to

repair the machines at any time of the day or night. But even with Vikram around, Anil often expresses concerns about maintenance. Mumbai's municipal government provides ventilators, Anil explains, but it does not offer adequate support to maintain them. "A person is on the venti for a week, but the machine can't go seven days without rest, it needs rest too," he says. Machines need respite and repair, just as humans do.

Anil began working in the ward 25 years ago as a lab assistant and is now in charge of maintaining all the instruments, especially the ventilators. He knows and remembers all sorts of options for support, and he is constantly calibrating the machines in ways that today's young residents don't know even existed because now the support options are pre-programmed. "We can only try," he says, to support life with the ventilators. "The rest is up to God." This is especially the case in the tenuous context of there being too many cases of respiratory distress and too few ventilators: "Being a government hospital," he continues, "we cannot refuse patients. We cannot tell a patient to go elsewhere. In that condition, what do we do? We keep on ambu-bagging. And we ask the relatives to ambu-bag the patient, and as soon as the ventilator gets free, we will make it available. In this condition, we are managing. We always tell them, 'We don't have a ventilator, but we will try. In the meantime, you have to ambu. If you have money, go to a private hospital. If you don't, wait.'" In Anil's rendering, the circulation of air and the circulation of patients through the disjunctures of the health care sector cannot be separated. He foregrounds the importance of relatives for breathing life in emergencies where air partially circulates through stuck structures.

### The Kin Ventilator and Intubating

Anil's emphasis on ambu-bagging shows how there are socialized forms of supporting breath that may occur before mechanical ventilation. Through global circulations of emergency resuscitation techniques, the "ABCs" (Airway, Breathing, and Circulation) are standard protocols when a patient arrives to the ward. When someone's breath reaches its limits, it interrupts the ward, and doctors must find ways to make breath available from elsewhere. System blood oxygenation ( $SpO_2$ ) is critical to determining how fragile a trauma case is, as is systolic blood pressure. If patients cannot breathe properly on their own, and their oxygen saturation and vital signs dip below acceptable limits, they will be ambu-bagged with a mask placed over their mouth. It is often the relative accompanying the patient who does the ambu-bagging, by rhythmically squeezing the bag attached to the mask. Sometimes, it is the orderly. Whoever it may be, ambu-bagging introduces the circulation of breath from hands to lungs.

Like most things in medicine, with ambu-bagging there are protocols, which assume a scenario populated by specific persons, in this case, the patient and doctor. Then there are the actualities, populated by other bodies: relatives who often are the ones who do ambu-bagging on arrival, and other patients who set the terms of availability of a ventilator. "Do it like this, 'one, two, three,'" an anesthetist instructs a father, squeezing the green bag connected to the mask on the mouth of his son who had been in a motorcycle crash. I asked the anesthetist her thoughts on "the kin ventilator" (*sagewalli ki venti*). "Actually," the doctor says, "it's better to



have him ambu-bagged because at least it's monitor-able. You can depend on it more than the ventilator." She brings the father a stool to sit on. A researcher in the ward watches the father squeeze the bag, and remarks that given the ward's resources, enrolling the relatives as accomplices in resuscitation is problematic but necessary. "But it should be someone strong," she says, someone who has the wherewithal to not cry, to not get distracted by their own exhausted body, to give themselves over to squeezing for their family member without pause or thought.<sup>6</sup> Human pumps may be more reliable than the machines whose maintenance and repair is past due, but these forced circulations cannot falter. Breath becomes social because it usually requires assistance, and therefore forms an obligation.

In the clinical and everyday worlds in India, people may draw attention to long-standing problems of breathing as a disease (*saans ki bimaari*) or as an episode, an "attack" (*saans ka attack*) (Das 2015). This is how one might reckon asthma (Fortun et al. 2014; Kenner 2018; Trnka 2017; Whitmarsh 2008), and the compromises of breath are especially evident in circumstances of tuberculosis (McDowell 2014; Venkat Forthcoming). In the case of the patient who had the motorcycle crash, the family members quickly figure out a protocol and operationalize it as the hours pass. One person will ambu-bag, and another will rub the man's legs. Another relative will stand outside the ward waiting to be called in as replacement. They sense what the injured breather needs and what sorts of breath they are able to provide. It is exhausting and anxious work, squeezing a bag to a specific rhythm, under the umbrella threat that if you err in your movements, your loved one may die. In keeping others breathing, people give the capacities of their own bodies over to others, a form of relational commitment that Lawrence Cohen has detailed in the cases of blood and organ donation in India (2013). The machine's economies raise the issue of availability—and unavailability—in thinking about what sort of biopolitics these moving commitments stand in for and accomplish (Cohen 2001, 2004; Cooper 2009; Crowley-Matoka 2016).

The anesthetist will take over the ambu-bagging in moments, but she is often busy preparing for the next possible attempt to work with the airway: intubation. This is how and when the ventilator comes into the picture and it is the moment when the body shifts from the condition of resuscitation to the condition of longer-term life support. Intubation can be a noisy affair, and sometimes must be done multiple times. A 50-year-old man in the ward due to a car accident begins to gurgle, signs of his diagnosed respiratory distress getting worse. He is already on a ventilator; its frantic beeps drown out the sounds of his suffocation. He coughs and bucks. The endotracheal tube that connects him to the ventilator is coming up, out of his trachea, out of his throat, out of his mouth. Its ends have been taped to his face with bandages; this is how you keep the tube in place. But he is extubating, for reasons unknown. The alarm alerts an anesthesia resident. This is her first week in the trauma ward, one of numerous rotations she will do throughout the hospital's varied ICUs. She looks at the vitals monitor attached to the man. The SpO<sub>2</sub> is dropping. He cannot breathe. The thing that was supposed to feed the man air, the ventilator, is no longer properly connected, now that the endotracheal tube is not where it should be. The circuit of resuscitation has been broken. Airways are channels constrained or enabled, and become a problem of affordances (Abrahamsson et al. 2015).

The anesthetist attempts to reestablish that circuit. She must intubate the man again. She yells for the orderly (*mama*, the Hindi term for maternal uncle) to come with an intubation tray equipped with a laryngoscope for visualizing and opening the airway. The alarm continues to beep; the *mama* flicks off the ventilator. The warning sign on the screen reads “circuit fault” but that fades to black as the machine powers down. It is a distraction in this moment. The job of the anesthetist is to establish an airway, a path between the world outside the body and into the body’s interior. This pathway is not given in trauma patients. It is made. After administering a sedative, she stands behind the man’s head, her eyes on his throat and chest. She takes a laryngoscope and inserts it slowly into the man’s throat. He is still bucking, gagging, fighting for air. She angles the scope’s blunt blade to visualize the man’s epiglottis. Now she can see. With her other hand, she guides in a fresh endotracheal tube, inching it down ... mouth, pharynx, past the vocal cords, into the trachea. The light on the laryngoscope and her angle of entry help ensure this pathway. She must get the tube down the trachea and not down the esophagus. Inflating the stomach with air would kill the man. Sometimes, intubation causes collateral damage: In the process of establishing an airway, the metal laryngoscope can break teeth if the scope hits and pulls incorrectly.

The tube is in. She moves it to the corner of the old man’s mouth, and the *mama* connects the fresh tube to the tubes coming from the ventilator. He turns the machine back on and it reboots. Its beeps resume, but this time they are pulsing, regularly, with each breath taken. This time, she tapes the tube to the man’s face twice over, like an X marks the spot of breathing. His oxygen saturation and blood pressure approach normal levels. “Once intubated, the ventilator becomes the central processing unit for patients,” the resident tells me, using the term for the core of a computer to describe a shift of life’s controls from being located within a person to being located outside them.

Intubation is not the end, either. In this ICU, the general practice is that the endotracheal tube is used for seven days but no longer. After that, surgeons will perform a tracheostomy. To maintain it, a small tube is inserted into the tracheostomy that can be connected to a vacuum pump to pull out secretions into a large bell jar on a cart that orderlies must empty. The jars contain breath’s undesirable liquid obstacles. The patients cannot speak, but they tear up when the tube is cleared with vacuum suction. Suction is done because secretions can seed secondary infections; ventilator-assisted pneumonia is a common occurrence and a constant concern (another way that air becomes a problem for life: this time, “dirty air”).

Relatives occasionally must perform suction; it can be one of the numerous tasks that the strained workforce in the ward offloads onto relatives. So if the patient in question has family, and they are present, it is quite possible that they be guided by the *mama* in suctioning the tube, just as they will also help with rolling bodies over to prevent bedsores and thumping on patients’ chests to loosen secretions there. A resident instructs a patient’s wife that the way to loosen secretions in the lungs is to pretend that she is eating with her hand. She is to feign the hand position of scooping up a ball of rice, thumb pressed against forefingers, and must thump on her husband’s chest. Only chest imaging will show the scope of possible pneumonia *in situ*. Otherwise, one must gauge it through auscultation—listening closely through a stethoscope—and by eyeing the volume of secretions sucked out into the bell jars

at the tail end of the vacuum pump. So much work goes into making the materiality of ventilation more vital than lethal, given its potential to be both things at once.

This elision of ventilator and vitality poses a problem for patients' kin, too. As this is a municipal public hospital, it principally serves the city's poorest populations, who are at the highest risk for traumatic injury. Families possess a basic knowledge that a machine was helping the breathing for their kin. They either knew this already, or doctors would explain that the patient was not breathing on his own, and a machine was breathing for him. This did not always work as an explanation, not because of a misunderstanding due to lack of education, but rather because the ventilator works somewhere in between machine and medicine. Relatives would sometimes ask if the ventilator was making "the body" better. The anesthetist would explain that the purpose of the machine was to breathe. Relatives understood that of course the machine was breathing for their injured kin, but it seemed to do so much more. It healed. It breathed life. Not only into the lungs, but into the body's capacity to regenerate too. On the thresholds of life, the ventilator makes breathing into social breathing because it can transcend the borders between medicine and machine, but this requires labors of everyone in the breathing room.

### Weaning

As patients breathe through the ventilator, other breathers in the room—kin and staff—often speak through the machine and craft ethical stances about what to do or not to do in the face of patients' uncertain survival potentials. A resident talks to the professor of anesthesiology, named Dr. T, who is currently overseeing the ICU. "Can't you just reduce (the ventilator support)?" she asks Dr. T. The subject of her concern about reduced support is an elderly man in the corner of the ICU named Mr. M. He is on a ventilator and his prognosis is very poor. Mr. M's brother has visited him constantly since his admission and has explained to the doctors that Mr. M *wants* to die. He insists on this, to them and to me. We have heard this several times, the ward staff and me.

By asking "can't you just reduce?" the resident means: Can't you just reduce the oxygen? Can't you just dial it down? Can't you just temper the air, so he will die? Dr. T replies quickly, "No, no." Not allowed. He summarizes: That would be euthanasia. Euthanasia is not legal in India. It is tantamount to killing. And so it is not done.<sup>7</sup> If Mr. M's condition was more stable, they would slowly reduce the assistance that the ventilator provides. In that hypothetical situation, his own respiratory system would take over. He would breathe by himself again.

But that is not the situation at hand. Mr. M's physiology and its interpretations by doctors suggest that he would die if removed from the ventilator. He cannot be removed from the ventilator, which is called weaning. Weaning is a common term in critical care medicine (Kaufman 2005; Lock 2002) and it is employed in the ward's vernacular as well: *Usko wean kar do*, "wean him." It implies calibrating the ventilator's set levels of oxygenation, air volume, and pressure. There is the metaphor here of slowly withdrawing a substance, of taking away in order to encourage a person to self-regulate. The idea of weaning on a ventilator is that a patient will be weaned from artificial, assisted ventilation to breathe on his or her own. Weaning is a stepwise transition, a way of activating the mostly independent breather in all of

us, as ventilation support is slowly decreased and the patient's response is assessed at every step.

Weaning is also carried out to manage the risks of a ventilated person becoming too accustomed to respiratory assistance. Ventilation can become damaging, even addicting in the ward's everyday clinical language. Medical professors always remind their residents to consider a strategy for weaning after a patient has been stabilized on mechanical ventilation. "Oxygen is injurious," Dr. T would remind his residents. It causes free radical damage. The very thing we think can solve the problem can easily exacerbate the problem, and so it must be carefully calibrated.<sup>8</sup> The ventilator is an ally who also damages you. And weaning is often nonlinear. Life support may be reduced, and the patient's breathing strengthens, only to falter again a few hours later. The machine's support will be amplified again. Remember, Dr. T instructs his residents, "ventilators are harmful to the patient." Critical care medicine can be a medicine of titrating damage, of striving toward the ends of stability via dangerous means.

Much of this danger has to do with the changeover from inspiration to expiration, called the trigger, which is of critical importance to the intensivist. The ratio of "normal" or "spontaneous" breathing is about 1:2 (1-second inhale to 2-seconds exhale). The ventilator's different modes can modulate this ratio to effect systemic change via the alveoli. But certain automatic modes on the ventilator, if not monitored correctly, can move air in forceful ways that distend the alveoli, which can cause circulatory damage and cardiac arrest in patients already on the verge of shock from traumatic injury. "Weaning is torture for anesthesiologists," a resident says, especially with patients who have chest trauma, rib fractures, and intercostal drains that make weaning harder to achieve. One must understand which of the ventilator's multiple, programmable modes are best suited for which clinical conditions. One must be attentive to the ways that patients respond to these modes. And one must be able to recognize the signs of spontaneous breathing in a patient who had until that moment been largely reliant on the machine. Weaning means the differentiation of breath between the body of the patient and the body of the machine. Weaning is a careful dance, a game of cat-and-mouse with the breath.<sup>9</sup>

But there is no weaning in sight for Mr. M. Consequently, the impossibility of weaning anchors how Mr. G speaks for his brother and his brother's breath. Dr. T tells me that this is tragic, that Mr. M will likely die on the ventilator, and this is no way to die: The ventilator is a life support, not a structure of a "good" death. Mr. M's brother, Mr. G, explains to me the tally card of the brother's good deeds. What Mr. M ate and drank in life—and more specifically, what he did *not* eat and drink—makes him into "a pious man": He was not a drinker; he did not eat non-veg. Mr. M is a Hindu, and in this context, his past ingestions will in part affect his future because he followed a vegetarian diet, caused no harm to animal forms of life as a result, and accrued karma. The signs of a good life get refracted through life's limits (Stonington 2012). The silences of the person in question—here, Mr. M, on the ventilator, not speaking—are important to the grid of ethics in play (Banerjee 2020; Pinto 2014). These moments evidence clinical commitments to therapy that demand a response, but the patient cannot speak, and the scene of ventilation gives the opportunity for elder male family members to approximate speaking.

"Let him have a peaceful death," Mr. G proclaims by his brother's bedside.

Sharon Kaufman observes that the indeterminacies of life support frequently pose the problem of a dignified death. “Dignity is in the eye of the beholder” because an intubated patient’s family members and hospital staff may clash over what counts as suffering and what counts as the cessation of that suffering through death (Kaufman 2005: 240). Indeed, Mr. G introduces this quandary in his declaration of what should count as a dignified death for his brother. One might interpret this claim from different perspectives. In one sense, Mr. G poses the issue of what the least bad death would be: to die without the ventilator. A second and concurrent perspective is what counts as *ventilator life* in the trauma ward—i.e., what *living on a ventilator* might mean. For Mr. G, it seems, his brother should not live on a ventilator because this is too much of a blur of life and death. In wishing for his brother to have a peaceful death, Mr. G wishes for some clarity amid too much contingency. Like the man who is dead-but-breathing discussed earlier, what underlies the tragedy in these scenes is not only the loss of a loved one, but the deepening of that loss through the blurring of states—living and dying—that medicine introduces as it tries to support life. Ventilation can indeed be a savior, but it can also be an existential shake-up. In critical and end-of-life situations, people mostly want a clearing to contend with impossible scenes, but a ventilator can muddy things at every turn.

Mr. G’s assertions are not taken for granted by the ward’s workers. Some of the nurses believe it. Others are more hesitant to accede so easily. After all, a nurse points out, the patient himself cannot talk, because he is intubated and unconscious. As with many patients in the trauma ward, illness narratives come secondhand. The ventilator deflects any easy collection of a first-person narrative. Information is often adjuvant. Is the brother’s wish to remove the ventilator a matter of compassion? Or is there some property or money or other kind of inheritance at stake? Ward staff don’t know, and don’t necessarily *want* to know. They are busy tending the cases that continue to come in, for the injuries do not stop. They do not necessarily have the time or energy or interest to follow the circulation of breath that Mr. G charts between his own words and his brother’s presumptive wishes. These wishes may make breathing social, but that doesn’t make all claims in the circuit true.

As for Mr. M, machines tell the staff what they must know in their rounds: his vital signs (degrading). His body offers signs like spontaneous movement or response to pain stimulus that doctors will repeatedly calculate and write in the record of his neurological abilities. These abilities seem to be diminishing. The ventilator is still beeping.

Several staff in the ward comment on Mr. M’s condition by centralizing the ventilator. One nurse says to the trauma resident, “Just turn the ventilator off” (*venti off kar ke do*). She does not say this out of not-knowing, for she was not new to the ward and therefore knew the protocols. It might be read as an expression of exasperation, perhaps a moment to demonstrate the overwhelmingness of breathing’s sociality. Still, she knows what the doctor would say: We cannot do that. There are protocols. One cannot simply turn the *venti off*; it is the patient who makes that happen, not us. We are not God. And Mr. M was about to die, anyway: “He’s going, today” (*jaata hai, aaj*) another nurse observes. Years of experience with the tangles of bodies and machines have taught her to estimate the rhythmic dwindling of someone’s potential for breathing on their own. She knows how to sense when the chest’s rises and falls are due more to the ventilator’s work than the individuated

body's life force at work. Noticing this rhythm of dying, the nurses tend to mark this shift by locating breathing more in the machine than in the person, and this uneven distribution can portend death.

In the case of Mr. M, we see how the ventilator intercedes in the retrospective framing of a life well-lived, as the life in question breathes uneasily. It remains unclear if Mr. M's death was peaceful, for who could answer such a question? But the nurse's predictions of his death's timing are nearly correct: He dies a day and a half later. The day following his death, I go on rounds with the residents. The one whose shift was ending gives an update on each patient for the incoming shift resident. He points to the empty bed previously occupied by Mr. M. No words, just a gesture to the empty space and the powered-down ventilator. "Good. He had to go," the other resident says. By this she means that Mr. M's death was not good, but it was good that he was no longer breathing in *this* room. To linger on life support in the ICU is a form of pain that no one should endure. Her eyes glanced upward, directing us to the expanse of the airy realm that encompassed all that the earthly realm could not. "*Honewalla*," she says: "That's where he's going." The impasse of life support was over. In death, Mr. M could move differently, released from the bonds of social breathing, to venture elsewhere.

## Conclusion

I traveled to Mumbai in March 2020 and ended the trip almost as quickly as it began. I returned to the United States days before Prime Minister Narendra Modi shut down the country, mandating that 1.2 billion people observe stay-at-home orders. In the days before the order, I needed to meet with my co-investigators at the hospital but I refused to go into the trauma ward and its ICU. I had been on an international flight. Biopolitical poles scale up and down: Mobility is a privilege and a threat; air's circulation affirms life and can also be lethal. I did not (and still do not) understand the complexities of asymptomatic transmission of the coronavirus and did not want or need to wait for new insights. In the context of this privileged not-knowing, I *did* know one thing: I could not bear the thought of further threatening the breathing of those in the trauma ward, of intruding on the fraught but crucial circuits of social breathing that keep them alive.

As the pandemic settled in locally, ventilators remained in critical supply. The government's ban on all flights, domestic and international, made importing essential parts for these complex machines difficult (Rajagopal 2020). Broader-scale circulations of capital, bodies, and panic materialized: the massive shifts of migrant laborers across the country; the groups of men barricading neighborhoods against "outsiders" in the name of quarantine; the empowerment of the police to use violent force against anyone suspected of breaching curfew; and the takeover of private-sector health care facilities by state and local governments to confront the demands for care. In mid-May 2020, ventilators moved through the jetstreams of the Earth's atmosphere. The United States donated 200 ventilators to India, a gift from President Donald Trump to Prime Minister Narendra Modi to combat what Trump called "the invisible enemy" of the virus. The gift raised questions of a potential quid-pro-quo because this gift occurred one month after India lifted its ban on the export of hydroxychloroquine and sent supplies of the drug to the United States (Basu 2020). By

the end of May, Mumbai's public hospital beds for Covid-19 patients were reaching their maximum capacity. Early concerns about ventilator availability shifted to concerns about the availability of oxygen support more generally, as hospital protocols shift to support oxygenation for patients as early as possible (Iyer 2020).

Air may indeed be a form whose substantiation is as-yet inadequately explored by anthropologists (Choy 2011). One aim of this article has been to examine the iatrogenic qualities of air in contexts of vital compromise and how assisted breathing circulates as a result. The substantiation of air as breath makes body and atmosphere unequally relational and distributed, and the ventilator further complicates this connection. Social breathing blurs the autonomic and the contingent work of bodies and shifts how we might understand the technological and political dependencies of supposedly individuated bodily actions (Mol Forthcoming; Shah 2018). In light of this article's examination of social breathing, I am calling for questions about how life support technologies remake social relations, in pandemic times and otherwise, and specifically how they do so through economies of movement.

Social breathing as a distributed form stands to reshape our understanding of the biopolitics of intensive care by drawing attention to uncertain techniques of the body. These techniques move at the hinge between person and environment, self and other, public and private health care systems, and medicine and machine. Life's valuation at this hinge takes shape through breath moving against its limits. So many families are saying goodbye to their kin in ICUs, if they can even achieve physical proximity to them. It is crucial to understand how ventilators mediate the edges of life and death by tracing the circulations of life support *as* the movements of life itself. As patients, families, and workers struggle both to breathe and to make others breathe, we might better grapple with the social relations that emerge as life support shapes life. It remains to be seen how, and to what degree, pandemics shift bodily techniques, but cases of social breathing offer some clues.

The commonsense model of the ventilator in the Mumbai trauma ICU is that it is a machine that breathes for the person who cannot. It is a model shot through with inequalities and ethics, which often emerge through movements of attachment and withdrawal to and from the machine. To ask about ventilation is to ask about the dynamic obligations of breath. Life support is a process done *to* someone and *for* someone. This entails a life politics that arcs across multiple persons and rarely leaves the ventilator out of the moral shockwaves of respiratory distress, possible death, and hopeful recovery. The breath, at the threshold of the natural and the artificial, plots the arc of life politics. As the breath moves, techniques of social breathing are both autonomous and dependent, both a choice and not a choice. Hold your breath and start counting to see how.

## Notes

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1. On pranayama, and its connections to both classic and contemporary forms of yoga and Hindu ritual, see Alter (2004).

2. My thanks go to one of this article's reviewers for encouraging me to engage Mauss and bodily techniques.

3. On breath as a capacity for survival in the face of state violence, see Sharpe (2016) on "aspiration," and Crawley (2017) on breath as a critical aesthetic of Pentecostalism.

4. See [https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-critical-care-issues?source=related\\_link#H4085782647](https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-critical-care-issues?source=related_link#H4085782647).

5. The fantasy of controlling air's circulation in buildings is taken up by Murphy (2006).

6. On the distribution of clinical labor among families in India, see, for example, Van Hollen (2003).

7. While euthanasia may be regarded in this scene as a form of killing, it is critical to situate its discussion in terms of (1) its different possible categories, such as "active" and "passive" euthanasia, which derive from bioethics and are cited in jurisprudence; (2) legal distinctions between murder and homicide not amounting to murder in the Indian Penal Code; and (3) the way that euthanasia crystallizes through certain high-profile Supreme Court of India cases, notably *Aruna Ramachandra Shanbaug v. Union of India & Ors* (2011). On questions of euthanasia, see Stavrianakis (2019).

8. Anesthetists carefully monitor arterial blood gas reports and coordinate those figures with specific levels of inspired oxygen (FIO<sub>2</sub>). In addition, ventilation is a generic term for specific modes of the ventilator: The anesthetist can set it to effect continuous positive airway pressure, or positive end expiratory pressure, or several other effects.

9. I am frequently asked if I ever saw the active decision to refuse weaning—i.e., to let someone die, or perhaps even make them die. The answer is unequivocally no. See Kaufman (2015) on the ways that U.S. hospitals can produce seemingly infinite options, and Tercier (2005) on the "slow code."

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