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# Saving Mothers' and Children's Lives? The Performance of German Lying-in Hospitals in the Late Eighteenth and Early Nineteenth Centuries

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**SUMMARY:** Medical men, turning to midwifery in the eighteenth century, claimed that they were able to save the lives of mothers and children, jeopardized by “ignorant” midwives. Consequentially, modern scholars have tried to assess the progress of obstetrics and the merits of lying-in hospitals on the basis of maternal and, more rarely, perinatal mortality rates. The data and methodological problems involved, however, have been largely ignored. Here they are discussed in the light of a micro-study based on detailed archival evidence from Göttingen University’s lying-in hospital, founded in 1751. Its mortality data are analyzed in comparison to those from other German and some foreign maternity hospitals. In a further step, perinatal and maternal mortality in hospitals is compared to that in normal home deliveries, attended by female midwives. By linking the findings to the eighteenth- and nineteenth-century debates about the pros and cons of lying-in hospitals, further questions are raised.

**KEYWORDS:** perinatal mortality, neonatal mortality, stillbirths, maternal mortality, lying-in hospitals, midwifery, obstetrics, birth weight, Göttingen, Germany

When medical men turned to midwifery in the eighteenth century, they promised to save the lives of mothers and children jeopardized by the alleged incompetency of “ignorant” midwives. This was the main reason they gave for entering a field that had been women’s domain for centuries.<sup>1</sup>

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1. Friedrich Benjamin Osiander, *Literarische und pragmatische Geschichte der Entbindungskunst* (Göttingen: Rosenbusch, 1799), 12; cf. Hans-Christoph Seidel, *Eine neue “Kultur des Gebärens”: Die Medikalisation von Geburt im 18. und 19. Jahrhundert in Deutschland* (Stuttgart: Steiner, 1998), 144.

Whereas traditional medical history, with its narrative of progress, implicitly supported this claim,<sup>2</sup> it has been fiercely contested by critical and feminist approaches in the late twentieth century. They have not only criticized the medicalization and hospitalization of childbirth as disempowering women, but also disputed the view that these processes were the cause of falling maternal and perinatal mortality.<sup>3</sup> Irvine Loudon, in his comparative analysis of maternal mortality in the English-speaking world and some countries of Continental Europe during the nineteenth century and first half of the twentieth century, has shown that hospitals were particularly dangerous for parturients, at least until the late nineteenth century.<sup>4</sup> Nevertheless, the debate is still running. Thus, Lisa Forman Cody has challenged entrenched positions by the double argument that eighteenth-century London lying-in hospitals “offered an almost completely feminine . . . space,” closely resembling “the early modern ideal of birth” at home, and that they were “statistically as safe as or safer than a home delivery in some years.”<sup>5</sup>

In most of this debate and research, perinatal mortality has caught much less attention than maternal mortality. Recently Robert Woods has taken a major step to redress the balance by studying fetal and early neonatal deaths.<sup>6</sup> A problem of his pathbreaking analysis is, however, that it mainly focuses on England, where data on stillbirths before 1927 are scanty. Therefore, he had to estimate earlier levels and changes of perinatal mortality, and explanations of the presumptive course of development necessarily remain tentative.

In current controversies about different ways of giving birth—hospital versus home, high tech versus natural—the point about mortality risks

2. In German, the most influential works were Eduard Caspar Jakob von Siebold, *Versuch einer Geschichte der Geburtshülfe*, 2 vols. (Berlin: Enslin, 1839–45), and Heinrich Fasbender, *Geschichte der Geburtshülfe* (Jena: Fischer, 1906).

3. Jean Donnison, *Midwives and Medical Men: A History of Inter-professional Rivalries and Women's Rights* (London: Heinemann, 1977); Marjorie Tew, *Safer Childbirth? A Critical History of Maternity Care*, 2nd ed. (London: Chapman, 1995); Jo Murphy-Lawless, *Reading Birth and Death: A History of Obstetric Thinking* (Cork: Cork University Press, 1998).

4. Irvine Loudon, *Death in Childbirth: An International Study of Maternal Care and Maternal Mortality 1800–1950* (Oxford: Clarendon, 1992).

5. Lisa Forman Cody, “Living and Dying in Georgian London’s Lying-in Hospitals,” *Bull. Hist. Med.* 78 (2004): 309–48, esp. 322–23, 342; Cody, *Birthing the Nation: Sex, Science, and the Conception of Eighteenth-Century Britons* (Oxford: Oxford University Press, 2005), 177.

6. Robert Woods, *Death before Birth: Fetal Health and Mortality in Historical Perspective* (Oxford: Oxford University Press, 2009); cf. Woods, “Lying-in and Laying-out: Fetal Health and the Contribution of Midwifery,” *Bull. Hist. Med.* 81 (2007): 730–59; Woods, “The Measurement of Historical Trends in Fetal Mortality in England and Wales,” *Popul. Stud.* 59 (2005): 147–62.

continues to play a key role, in both Western and non-Western societies. Interestingly, many discussants consider as relevant not only the most recent data, but also figures from earlier centuries. Either side in the debate seems convinced that the foundations for present-day birthing practices were laid in the eighteenth and nineteenth centuries, and that success and failure in those times bear a meaning for the present.

This article does not aim at sweeping generalizations, but focuses on a specific period and geographic area. It compares perinatal and maternal mortality in specialized hospitals and wards to mortality in ordinary home births during the late eighteenth and early nineteenth centuries. In the German-speaking world, this was an early phase of medicalized and hospitalized childbirth, but deliveries in hospitals were already frequent enough to produce meaningful statistics. The hospitals were directed by the most renowned male obstetricians, whereas deliveries in the women's homes were overwhelmingly attended by female midwives. Therefore, our aim is to find out whether or to what extent men-midwives were able to keep the promise of saving lives in those institutions that were under their immediate control. In this regard, analyzing not only maternal but also perinatal mortality is particularly interesting. For it is well known that puerperal fever was a more serious problem in hospitals than in home deliveries. If, before the era of antiseptics and asepsis, in-patients could not be protected from this often lethal disease, we may wonder whether at least the children fared better in specialized hospitals than elsewhere.

The data for Germany during this period are relatively good, although not so good as those for Sweden, where nationwide statistics are available from the mid-eighteenth century. Quite a few German lying-in wards and hospitals published mortality data. The figures, however, need to be discussed critically. This can best be done at the micro level, using the surviving archival material of one of the institutions for a detailed case study. As for perinatal mortality in home births, data from family reconstitutions can be used for several regions in different parts of Germany. Maternal deaths were registered with sufficient care in many districts, towns, and cities. Still, the remaining data problems cannot easily be solved by applying correction factors. This is not surprising, for even in the late twentieth century data on perinatal mortality not only are deficient in developing countries, but also are not fully comparable across Europe.<sup>7</sup> Moreover, potential social and demographic biases have to be considered when

7. *Neonatal and Perinatal Mortality: Country, Regional and Global Estimates* (Geneva: World Health Organization, 2006); C. Gourbin and G. Masuy-Stroobant, "Registration of Vital Data: Are Live Births and Stillbirths Comparable All over Europe?," *Bull. World Health Organization* 73, no. 4 (1995): 449–60; cf. Woods, *Death before Birth* (n. 6), 24–27.

comparing mortality in and out of institutions. Since the interaction of all these factors can hardly be expressed in quantitative terms, we discuss problems and weigh possible biases, instead of trying to obtain clean and absolutely comparable data.

The lying-in hospital of Göttingen, at which we look more closely, played a pioneering role, at least in Germany. Founded in 1751, it appears to have been the first maternity clinic worldwide that was a university institution. Several aspects of its activities have already been explored.<sup>8</sup> Its mortality, however, can be analyzed only in the comparative framework that this article provides. For assessing the quality of the registration of deaths, it is crucially important that from 1791 the complete admission books are available, where the hospital clerk entered basic data on all patients and children born. In addition, for many years the hospital case book (“diary”) survives. There, the director used to write a double page on each case.<sup>9</sup> This means that, for examining the practice of birth and neonatal care, we have a large and unbiased sample of cases, whereas when using only printed sources we are limited to those cases that the doctor selected for publication. Moreover, the original case histories, although stylized according to the obstetrician’s criteria, have not been reshaped once more for impressing a broad reading audience.<sup>10</sup>

8. Jürgen Schlumbohm, “Verheiratete und Unverheiratete, Inländerin und Ausländerin, Christin und Jüdin, Weiße und Negerin’: Die Patientinnen des Entbindungshospitals der Universität Göttingen um 1800,” in *Struktur und Dimension: Festschrift für Karl Heinrich Kaufhold*, ed. Hans-Jürgen Gerhard (Stuttgart: Steiner, 1997), 1:324–43; Jürgen Schlumbohm, “The Pregnant Women Are Here for the Sake of the Teaching Institution’: The Lying-in Hospital of Göttingen University, 1751 to c. 1830,” *Soc. Hist. Med.* 14 (2001): 59–78; Jürgen Schlumbohm, “Grenzen des Wissens: Verhandlungen zwischen Arzt und Schwangeren im Entbindungshospital der Universität Göttingen um 1800,” in *Geschichte des Ungeborenen*, ed. Barbara Duden et al. (Göttingen: Vandenhoeck, 2002), 129–65; Jürgen Schlumbohm, “The Practice of Practical Education: Male Students and Female Apprentices in the Lying-in Hospital of Göttingen University, 1792–1815,” *Med. Hist.* 51 (2007): 3–36; Jürgen Schlumbohm, *Lebendige Phantome: Ein Entbindungshospital und seine Patientinnen 1751–1830* (Göttingen: Wallstein, 2012).

9. *Tagebuch* (hospital diary, hereafter TgB); *Aufnahmebuch* (admission book, hereafter AuB). Both of these archival sources are preserved in the department Ethik und Geschichte der Medizin of Göttingen University. TgB, vols. 4 (1795–97), 6–7 (1799–1802), and 10–14 (1806–14) and AuB, vols. 1–2 (1791–1829), have been used systematically for this article. TgB, vols. 1–3 (1792–95), 5 (1797–99), 8–9 (1802–5) are missing. Roederer’s case book has also been preserved and was summarized in print: Johann Georg Roederer and Friedrich Benjamin Osiander, *Tabellarisches Verzeichniss aller in der Königl. Entbindungsanstalt zu Göttingen . . . 1751 bis . . . 1762 vorgefallenen Geburten* (Göttingen: Vandenhoeck, 1795).

10. On case histories, see Christian Probst, *Der Weg des ärztlichen Erkennens am Krankenbett* (Wiesbaden: Steiner, 1972), esp. 45ff., 89ff., 117ff., 191ff.; Barbara Duden, *The Woman Beneath the Skin: A Doctor’s Patients in Eighteenth-Century Germany* (Cambridge, Mass.: Harvard

Under its first director, Johann Georg Roederer (1726–63), the Göttingen lying-in facility had just two rooms in a late medieval hospital and delivered about 10 to 30 women annually. In 1791, a new spacious building was opened for the maternity hospital, and in 1792 Friedrich Benjamin Osiander (1759–1822) was appointed director and professor of obstetrics. During his thirty years in office, there were usually between 75 and 100 births per year. In the 1820s the number rose to 150. As the directors clearly stated, teaching medical students was the primary goal of the institution. Training midwife apprentices was a second purpose, and giving shelter to poor pregnant women came only in third place. Shaping the practice of midwifery according to these priorities was easier for the obstetrician in the medium-sized Göttingen hospital than in huge institutions, where most of the “normal” deliveries were attended by female midwives.<sup>11</sup> Thus, the effects of medicalization and hospitalization should be particularly visible in Göttingen.

## Neonatal Care and Perinatal Mortality

Like other men-midwives in his time,<sup>12</sup> Professor Osiander emphasized that he struggled for the life of every newborn child who seemed weak or showed no evidence of life. His textbook emphatically told the students “never [to] consider a child dead immediately after birth, whatever its appearance and condition may be.” It gave no fewer than seventeen directions for resuscitating a child, for example, bathing in warm water,

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University Press, 1991), 62ff.; Steven M. Stowe, “Seeing Themselves at Work: Physicians and the Case Narrative in the Mid-Nineteenth-Century American South,” *Amer. Hist. Rev.* 101 (1996): 41–79; Gianna Pomata, “*Praxis Historialis*: The Uses of *Historia* in Early Modern Medicine,” in *Historia: Empiricism and Erudition in Early Modern Europe*, ed. Gianna Pomata and Nancy G. Siraisi (Cambridge, Mass.: MIT Press, 2005), 105–46. On the importance of using case books listing *all* deliveries, see Alannah Tomkins, “Demography and the Midwives: Deliveries and Their Dénouements in North Shropshire, 1781–1803,” *Continuity and Change* 25 (2010): 199–232.

11. Jacques Gélis, *La sage-femme ou le médecin: Une nouvelle conception de la vie* (Paris: Fayard, 1988), 56–61; Scarlett Beauvalet-Boutouyrie, *Naître à l'hôpital au XIXe siècle* (Paris: Belin, 1999), 25–31, 124–34; J. Fischer, *Geschichte der Geburtshilfe in Wien* (Leipzig u.a.: Deuticke, 1909), 174, 195, 200–201, 255; Cody, “Living and Dying” (n. 5), 314–18; Cody, *Birthing the Nation* (n. 5), 176–78; Adrian Wilson, *The Making of Man-Midwifery: Childbirth in England, 1660–1770* (London: UCL Press, 1995), 146–48; Ian Campbell Ross, “Midwifery,” in *Public Virtue, Public Love: The Early Years of the Dublin Lying-in Hospital, the Rotunda*, ed. Ross (Dublin: O'Brien, 1986), 125–64, esp. 152.

12. Josephine M. Lloyd, “The ‘Languid Child’ and the Eighteenth-Century Man-Midwife,” *Bull. Hist. Med.* 75 (2001): 641–79; Beauvalet-Boutouyrie, *Naître* (n. 11), 268–72; Gélis, *La sage-femme* (n. 11), 357–61.

drawing the slime out of the throat, fanning or blowing fresh air into the mouth, rubbing with wine or spirits, pressing the breast mildly or knocking the rear and back now and then, clystering with wine, and placing ammonia liquid or other light irritants under the nose. If the newborn had a blue color “like a strangled person, you should cut the umbilical cord immediately and let it bleed about two spoonfuls.” Many of these remedies were also used by traditional midwives. The last recommendation, however, showed that Osiander was an up-to-date medical man: “As a final resort . . . , try to resuscitate the last spark of life by electricity, and especially by galvanism.”<sup>13</sup> The case notes in the hospital diary show that the professor had frequent opportunities to demonstrate the techniques of reanimation to medical students and midwife apprentices. The experiments with galvanism were less successful, and given up soon.<sup>14</sup>

Concerning other aspects of obstetrics, Professor Osiander took a peculiar approach. He vehemently opposed any operation that the fetus could not survive, such as embryotomy and craniotomy. Living in the era before the stethoscope, he was convinced that there was no certain way of knowing whether or not a fetus had died, and was determined to fight for every child’s life, already before birth. But he emphasized the risks inherent in the process of childbirth, and had not much confidence in the “forces of nature,” if complications emerged. Instead, he believed in the “art” of obstetrics. In particular, he considered the forceps as a means for minimizing the mother’s and the child’s suffering and for delivering a living child in most complicated cases. In Germany, unlike in England, a medical man would still be called to a parturient in case of complications rather than for a natural birth. This was probably one of the reasons why teaching medical students how to use the forceps was such a priority for Osiander. In fact, during his thirty years of office, the forceps were used at Göttingen maternity hospital in 40 percent of all deliveries, and other operations were performed in 6 percent of the cases.<sup>15</sup>

After birth, the obstetrician’s attention to the child lasted only for a few hours, according to the hospital diary. Then the mother and the hospital midwife took over responsibility, and the case book does not talk about

13. Friedrich Benjamin Osiander, *Grundriss der Entbindungskunst, zum Leitfaden bei seinen Vorlesungen* (Göttingen: Dieterich, 1802), 2:72–81. For traditional midwives, see Jacques Gélis, *L’arbre et le fruit: La naissance dans l’Occident moderne XVIe–XIXe siècle* (Paris: Fayard, 1984), 250–53.

14. Friedrich Benjamin Osiander and Johann Friedrich Osiander, *Handbuch der Entbindungskunst*, vol. 2, pt. 2 (Tübingen: Osiander, 1821), 261–67.

15. Schlumbohm, “Pregnant Women” (n. 8), 69–72; Schlumbohm, “Practice” (n. 8), 27–33. For England in the late eighteenth century, see Wilson, *Making of Man-Midwifery* (n. 11), 164–69.

the child's condition any more. With rare exceptions, only its death is mentioned in the diary, usually with the cause of death (e.g., "died from cramps"), but without any notes on how the child's disease had developed or had been treated. In 10 percent of the deaths, the director did not even record that the child died; only the clerk mentioned it in the admission book. On the other hand, in no more than 1 percent of children's deaths the clerk forgot to mention it. Osiander was not exceptional among the obstetricians of his time in focusing exclusively on birth and the very first hours of the newborn child. In spite of some early beginnings, pediatrics as a special field of medicine emerged only in the late nineteenth century.<sup>16</sup>

Certainly, Professor Osiander was convinced that by his art he saved the lives of many children. But instead of inferring success from endeavors,<sup>17</sup> it is safer to actually calculate the death rate in his hospital, and compare it to the mortality elsewhere. Of course, our data do not exactly meet present-day definitions and criteria. According to World Health Organization (WHO) standards, perinatal mortality includes fetal deaths after twenty-two weeks of gestation and *early* neonatal deaths, that is, deaths during the first seven days after delivery; neonatal deaths are those that occur in the first twenty-eight days of life.<sup>18</sup> As for perinatal mortality, some fetal deaths are missing in our data, since women were usually not under observation from the twenty-third week of pregnancy. On the other hand, Table 1 accepts the hospital clerk's definition of stillbirths, although he included some cases in which the director did find evidence of life, such as breathing, beating of the heart, pulsation of the umbilical cord, or movement of voluntary muscles (which means that, according to WHO criteria, they would qualify as live births). This is true in 17 percent of children's deaths, whereas only 3 percent were recorded as stillborn by the director and as died after birth by the clerk. In Table 1, only the small number of deaths that were altogether forgotten in the admission book but reported in the diary has been added. The reason for using

16. Catherine Rollet, *Les enfants au XIXe siècle* (Paris: Hachette, 2001), 205–11; Iris Ritzmann, *Sorgenkinder: Kranke und behinderte Mädchen und Jungen im 18. Jahrhundert* (Köln: Böhlau, 2008).

17. Lloyd, "Languid Child" (n. 12), 679, argues in this way.

18. *Neonatal and Perinatal Mortality* (n. 7), 6. Usually mortality rates (except for fetal mortality) are calculated per 1,000 *live* births. In this article, I have calculated (early) neonatal mortality rates per 1,000 *total* births (i.e., including stillbirths in the denominator) in order to make stillbirth rates and (early) neonatal mortality rates directly comparable and to allow calculating a rate of perinatal mortality. Since my tables include the absolute numbers, mortality rates can easily be recalculated per 1,000 live births.



the clerk's admission books as the main source is that they are available for the whole period under study, whereas the director's diaries are not. In order to come closer to the current definition of perinatal mortality, Table 1 distinguishes between infants who died during the first week of life (zero to six days after birth) and those who died later (but before leaving the hospital). On average, women stayed in the hospital for fourteen days after delivery. In all, 53 percent left between thirteen and fifteen days after giving birth, 25 percent exactly on the fourteenth day. Thus mothers and children were under observation for an average of two weeks in the Göttingen hospital.

As Table 1 shows, during the period of full documentation, 1791–1829, one out of eight children either was stillborn or died before leaving the hospital. More precisely, one out of ten succumbed to perinatal mortality, that is, was stillborn or died during the first week of life (early neonatal mortality). In the latter half of the period, mortality was somewhat lower than in the first half, but the time span under study is not long enough to ascertain a clear trend. Anyway, Roederer had lost even more children. Out of the 235 babies born 1751–62, 5 percent were stillborn, and at least 13 percent died in the hospital, that is, mortality amounted to no less than 18 percent. In 1791–1829, according to the admission books, stillbirths (7 percent) were more frequent than deaths in the first two weeks of life (6 percent).

Given Osiander's peculiar approach to midwifery, it is interesting to see which impact the use of the forceps had on the children's chances of survival. If we compare the mortality of natural births to forceps deliveries, the difference seems small. Of the children extracted by the forceps, 89.4 percent left the hospital living, and 90.5 percent of those born naturally. After podalic versions, the outcome was quite different: only 29 percent survived. But this operation was performed in no more than 5 percent of all cases, and apparently only where the director deemed it absolutely necessary. Thus, the data from his hospital seem to confirm Osiander's point that, contrary to the a priori reasoning of some critics, the forceps, when applied by a well-trained and careful practitioner, were not detrimental to the health and life of the fetus.<sup>19</sup>

For a fair assessment of the impact of the forceps, however, we should take into account that babies with low birth weight (less than 2,500 g, approx. 5 pounds 8 ounces), who were at a high risk, were more frequently born naturally (65 percent), less often by a forceps operation (19

19. Osiander, *Grundriss* (n. 13), 2:60–62.

Table 1. Stillbirths and infants who died in the Göttingen lying-in hospital, 1751–62 and 1791–1829 (rate per thousand of total born)

Years	Total born		Out of total born						Total dead	
	<i>n</i>	Stillborn <i>n</i> Rate	During first week		Died in hospital		Subtotal		<i>n</i>	Rate
			<i>n</i>	Rate	<i>n</i>	Rate	<i>n</i>	Rate		
1751–62	235	12 51					30	128	42	179
1791–99	678	38 56	39	58	22	32	61	90	99	146
1800–09	844	72 85	36	43	21	25	57	68	129	153
1810–19	887	63 71	28	32	13	15	41	46	104	117
1820–29	1,204	78 65	25	21	27	22	52	43	130	108
Total			128	35	83	23	211	58	462	128

Sources: Roederer and Osiander, *Tabellarisches Verzeichnis* (n. 9); *Aufnahmebuch*, vols. 1–2, supplemented by *Tagebuch*, vols. 4, 6–7, 10–14.  
 Note: The mortality figures for 1751–62 are the minimum, since for 84 children the source does not explicitly state whether or not they survived; nevertheless, here they have been counted as surviving, not as missing.

percent),<sup>20</sup> than other children. If we consider only children who weighed at least 2,500 grams, the mortality of forceps deliveries was double that of natural births: If the forceps were used, there were 3.5 percent stillbirths and another 6.0 percent died before leaving the hospital, compared to 1.3 percent and 3.4 percent in natural births. These figures sound particularly alarming, since Professor Osiander occasionally admitted that only a minority of the forceps operations were performed out of “urgent necessity,” and that most were done for “quickly finishing a delayed or painful labor” and/or “for teaching” and letting “the students practice.”<sup>21</sup> Does all this mean that the overactive obstetrician, by his frequent use of the instrument, exposed the fetuses and infants to extra risks instead of saving their lives? Interpreting the data is not straightforward. For it remains to be determined whether the higher mortality actually was a consequence of the use of the forceps, or whether the forceps were used because of imminent danger at least in a substantial minority of cases. Comparing the data from Osiander’s hospital to those of other institutions whose directors had a less extreme or even opposite approach to midwifery will shed more light on this issue.

Other maternity hospitals made similar efforts to revive frail newborn babies as Osiander did. But in most of them, the forceps were used much less. In Dresden 1814–27 they were applied in 7 percent of all deliveries, in Berlin’s university clinic 1817–29 in 11 percent.<sup>22</sup> Compared to the mortality in other German hospitals (Table 2), the record of Osiander’s institution does not look bad. Elsewhere the proportion of those who either were stillborn or died in the facility was usually in the same range, sometimes clearly higher. Only at Berlin University, it was lower. This seems to support the conclusion that Osiander’s obsession with the forceps did not involve an additional risk for the children’s life, or that it may even have been beneficial.

Several caveats, however, have to be considered with regard to the quality and comparability of the data. First, it is striking how much the ratio of stillbirths to neonatal deaths differs between the institutions. Since we know that in Göttingen the director and clerk used different criteria for distinguishing live births and stillbirths, we may well assume that not all hospitals applied the same definition in their statistics. This difficulty can be eluded by focusing on the “total dead” column in Table 2. A problem,

20. Of the children with low birth weight, 11 percent were delivered by podalic version, 5 percent by other operations.

21. Friedrich Benjamin Osiander, *Kurze Übersicht der Vorfälle in dem Königl. Entbindungshospitale . . . zu Göttingen vom 1. April 1795 bis 31.[!] September 1795* (Göttingen: 1795), [2].

22. Seidel, *Eine neue “Kultur”* (n. 1), 218–19, 298–300.

Table 2. Stillbirths and infants who died in several German lying-in hospitals, late eighteenth century to early nineteenth century (rate per thousand of total born)

Place	Years	Total born		Stillborn		Out of total born Died in hospital		Total dead	
		<i>n</i>	Rate	<i>n</i>	Rate	<i>n</i>	Rate	<i>n</i>	Rate
Berlin (Charité) 1	1750–53	658		32	49	87	132	119	181
Berlin (Charité) 2	1766–74	1,300		112	86	215	165	327	252
Kassel	1763–81	1,570		83	53	142	90	225	143
Munich	1782–1826	8,529		393	46	876	103	1,269	149
Hamburg	1796–1828	2,939		288	98	187	64	475	162
Leipzig	1810–30	1,653		138	83	56	34	194	117
Dresden	1814–27	2,557		198	77	153	60	351	137
Berlin (University)	1817–28	1,837		65	35	89	48	154	84

Sources: Berlin (Charité): Süßmlich and Baumann, *Die göttliche Ordnung* (n. 23), vol. 3, Anhang 19, cf. 210–11. Kassel: Oslander, *Beobachtungen* (n. 51), 251. Munich: Martin, *Geschichtliche Darstellung* (n. 24), 174–75. Hamburg: Homann, “Die Entbindungsanstalt zu Hamburg” (n. 24), tables I–II. Leipzig: Carl S. F. Credé, *Bericht über die Vorgänge in der Entbindungsschule zu Leipzig . . . 1810 bis . . . 1859* (Leipzig: Engelhardt, 1860), 10–11. Dresden: Carl G. Carus, “13. und letzter Bericht . . .,” *Gemeinsame deutsche Zeitschrift für Geburtshunde* 3 (1828): 126–46, esp. 145 (table). Berlin (University): Siebold, *Die Einrichtung* (n. 24), 80, 83.

however, is that we usually lack precise data about how long mothers and babies stayed in the hospital after the delivery, that is, how long they were under observation. For the lying-in ward of Berlin's Charité hospital, the source says that "died" means "died in the first month."<sup>23</sup> For Berlin's university clinic, a stay of two weeks after delivery is mentioned as a rule in the early nineteenth century, for Hamburg fourteen to sixteen days, for Munich one week in the 1830s. For the other hospitals, information on this point is even vaguer or lacking altogether. Besides, general statements on the usual length of the stay appear not to be very trustworthy. Osiander, for example, wrote that if lying-in mothers were "perfectly healthy," they had to leave the Göttingen hospital fourteen days after delivery in summer, and after three weeks in winter. Analyzing the individual-level data from the admission books, we find, however, that only 4 percent of the patients stayed for three weeks or more after delivery in 1791–1829.<sup>24</sup>

Moreover, the reliability of the data published by the hospital directors is not without problems. That Osiander forgot to register 10 percent of the deaths could be discovered only by comparing his case book to the clerk's admission records. Quite a few hospitals did not disclose the number of children who died after birth.<sup>25</sup> If a lying-in facility was linked to a foundling hospital where most babies were transferred very soon after birth, as in Vienna or Paris,<sup>26</sup> it could not produce any meaningful statistics on neonatal mortality. In other institutions, however, the lack of figures raises questions about the quality of its registers. The director of Jena University's maternity hospital explicitly stated in 1848 that, under his predecessors, many neonatal deaths were not recorded at all.<sup>27</sup> All this means that without additional sources, preferably at the level of individual

23. Johann Peter Süßmilch and Christian Jacob Baumann, *Die göttliche Ordnung in den Veränderungen des menschlichen Geschlechts*, 4th ed., vol. 3 (Berlin: Realschule, 1776), Anhang 19. During the year 1801–2, patients of the Charité in fact stayed for an average of twenty-nine days after being delivered (but the variance was great): calculated from Christian Ludwig Mursinna, "Verzeichnis und Beschreibung aller Geburten des vorigen Jahrs in der Charité," in *Neues Journal für die Chirurgie, Arzneikunde und Geburtshülfe* 1, n. 1 (1803): 122–36, tables.

24. Eduard Caspar Jakob von Siebold, *Die Einrichtung der Entbindungsanstalt an der Königl. Universität zu Berlin* (Berlin: Enslin, 1829), 33; E. F. Homann, "Die Entbindungsanstalt zu Hamburg," *Mitteilungen aus dem Gebiete der gesamten Heilkunde* 1 (1830): 183; Anselm Martin, *Geschichtliche Darstellung der Kranken- und Versorgungsanstalten zu München* (Munich: Franz, 1834), 169; Friedrich Benjamin Osiander, *Denkwürdigkeiten für die Heilkunde und Geburtshülfe*, vol. 1, pt. 1 (Göttingen: Vandenhoeck, 1794), xciv.

25. This is true of the hospitals in Marburg, Kiel, Heidelberg, and Würzburg; see the sources cited in the note to Table 6.

26. Verena Pawlowsky, *Mutter ledig–Vater Staat: Das Gebär- und Findelhaus in Wien 1784–1910* (Innsbruck: Studien-Verlag, 2001), 113; Beauvalet-Boutouyrie, *Naître* (n. 11), 265–76.

27. Eduard Martin, *Die Gebäranstalt und die geburtshülflichen Kliniken der Universität Jena* (Jena: Frommann, 1848), 50.

cases, published statistics on fetal and especially neonatal mortality in hospitals should be considered only as a first indicator, not as definitive proof.

This caveat may be advisable for data from other countries, too. For the British Lying-in Hospital in London and the Dublin Lying-in Hospital (Rotunda), we have wonderful tables with the annual numbers of children born, stillbirths, and deaths for many decades without interruptions (Table 3). They indicate a lower perinatal mortality than their German counterparts. This applies especially to deaths after 1770 or 1780. Closer inspection, however, raises a number of questions. At the Rotunda, the stillbirth rate was very stable over the half century, whereas the category of "children died" decreased dramatically. From 1780 to 1789 the annual rates of children who died in hospital were 122, 116, 126, 77, 59, 66, 37, 43, 37, and 26.<sup>28</sup> Traditional medical history has attributed this achievement to the local hero, Joseph Clarke, who became assistant master of the Rotunda in 1783 and master in 1786. The weapon he chose for fighting mortality was ventilation. This is very much in line with eighteenth-century medicine's obsession with "miasma." Modern medical experts, however, are less than convinced that boring holes through doors and window frames was enough for improving the neonatal mortality statistics to such an amazing extent. A more likely candidate might be the reduction of the normal stay in hospital after delivery from fourteen to seven days, which occurred at the Rotunda in the 1780s.<sup>29</sup> Tables 1 and 4 suggest that this must have had a considerable effect on the number of infants who died in hospital, although a cutback by more than a week would be required for explaining the tremendous decrease of deaths. Around 1800 there was another sudden drop of children who died in the Rotunda, this time by almost a half, which is also waiting for an explanation. The figures from the British Lying-in Hospital seem less suspect, but should perhaps not be taken at face value either. Part of the decline of neonatal deaths is compensated by a rising number of stillbirths in the 1770s, which suggests that the definitions of live and stillbirths may have changed. In the mid-1760s, there was an astounding decrease of children who died in hospital: from 1760 to 1769 the annual rates were 134, 78, 95, 76, 46, 35, 28, 17, 3, and 23.<sup>30</sup> It would be useful if additional sources allowed

28. Calculated from John Warburton et al., *History of the City of Dublin* (London: Cadell, 1818), 2:681, per 1,000 total births.

29. Ross, "Midwifery" (n. 11), 155–58; cf. Mary A. Kelly, "The Development of Midwifery at the Rotunda," in *Masters, Midwives and Ladies-in-Waiting: The Rotunda Hospital, 1745–1995*, ed. Alan Browne (Dublin: Farman, 1995), 77–117, esp. 80; Cormac Ó Gráda, "The Rotunda and the People of Dublin 1745–1995," in Browne, *Masters*, 240–63, esp. 247.

30. Calculated from William Heberden, *Observations on the Increase and Decrease of Different Diseases* (London: Payne, 1801), 39–41, per 1,000 total births. Woods, *Death before Birth* (n. 6), 92, Table 4.3, also shows the decennial figures for the British Lying-in Hospital and data for other subperiods from the Rotunda.

Table 3. Stillbirths and infants who died in the British Lying-in Hospital, London, and the Rotunda Hospital, Dublin, late eighteenth century to early nineteenth century (rate per thousand of total born)

Place	Years	Total born		Stillborn		Out of total born Died in hospital		Total dead	
		<i>n</i>	Rate	<i>n</i>	Rate	<i>n</i>	Rate	<i>n</i>	Rate
British Lying-in Hospital	1750–59	3,806		113	30	224	59	337	89
	1760–69	4,919		132	27	238	48	370	75
	1770–79	5,697		232	41	129	23	361	63
	1780–89	5,620		293	52	129	23	422	75
	1790–99	6,047		285	47	74	12	359	59
Total	1750–99	26,089		1,055	40	794	30	1,849	71
Rotunda Hospital	1757–69	6,780		357	53	1,293	191	1,650	243
	1770–79	7,878		372	47	1,267	161	1,639	208
	1780–89	12,477		703	56	820	66	1,523	122
	1790–99	16,382		813	50	619	38	1,432	87
Total	1800–11	28,075		1,682	60	585	21	2,267	81
	1757–1811	71,592		3,927	55	4,584	64	8,511	119

Sources: Heberden, *Observations* (n. 30), 39–41; Warburton et al., *History* (n. 28), 2:681.

exploring whether or to what extent the Dublin and London hospitals really experienced improvements in (early) neonatal mortality, not fading care for registering children's deaths or shorter stays in the clinic after delivery. That would also help to ascertain how far the data from different hospitals are comparable.

For assessing the performance of hospitals, we have to compare their mortality with that of home deliveries, which were overwhelmingly attended by female midwives in Germany during this period.<sup>31</sup> Table 4 presents figures from the Berlin Data Bank, which contains regional clusters of family reconstitutions.<sup>32</sup> Since family reconstitutions are based on parish registers, which originally record baptisms, not births, it is important to make sure that stillbirths and babies who died before baptism are fully listed. Regions that do not stand this test have been omitted from the table. For the same reason, some years and villages have been excluded even within the selected regions.<sup>33</sup>

Table 4 separates mortality in the first week of life (zero to six days after birth) from that in the second week (seven to thirteen days) in order to allow comparisons with maternity hospitals under different assumptions about the average time span during which newborn infants (and their mothers) were "under observation" in institutions. Except for the Berlin Charité, I have not found any evidence suggesting that in a lying-in hospital the mean stay after delivery was more than two weeks.

There may be problems with the distinction between live and stillbirths. This is not surprising, since we know that even within a single hospital (Göttingen) the incumbents disagreed on this point. With regard to parish registers, religious sensibilities of clergymen and parishioners come into play. Particularly for Catholics baptism was crucially important for saving a child's soul, but a dead body could not be baptized.<sup>34</sup> Therefore, Catholics may have seen vital signs in infants who would have been considered to be stillborn by others. This can be the reason why in the Ortenau region the stillbirth rate is unrealistically low and the rate of

31. Seidel, *Eine neue "Kultur"* (n. 1), 313–21, 337–39.

32. Arthur E. Imhof, *Lebenserwartungen in Deutschland vom 17. bis 19. Jahrhundert*, with the collaboration of Rolf Gehrman et al. (Weinheim: VCH Acta Humaniora, 1990); Ines Elisabeth Kloke, "Säuglingssterblichkeit in Deutschland im 18. und 19. Jahrhundert am Beispiel von sechs ländlichen Regionen" (Phil. diss., Freie Universität, 1997), <http://www.diss.fu-berlin.de/1998/19/index.html>.

33. For details, see Rolf Gehrman and Maureen Roycroft, in Imhof, *Lebenserwartungen* (n. 32), 65; Kloke, "Säuglingssterblichkeit" (n. 32), 54. See note 35 below. For the deficiencies of English parish registers, see Tomkins, "Demography and the Midwives" (n. 10).

34. Jacques Gélis, *Les enfants des limbes: Mort-nés et parents dans l'Europe chrétienne* (Paris: Audibert, 2006).



Table 4. Stillbirths and infants who died in first two weeks in several German regions, 1790–1829 (rate per thousand of total born)

Region	Total born <i>n</i>	Out of whom						Total dead			
		Stillborn		Died			Subtotal		<i>n</i>	Rate	
		<i>n</i>	Rate	In first week <i>n</i>	Rate	In second week <i>n</i>	Rate	<i>n</i>			Rate
East Frisia	5,422	208	38	140	26	50	9	190	35	398	73
Hartum, Westphalia	4,762	175	37	90	19	78	16	168	35	343	72
Ortenau, Baden	15,794	296	19	706	45	354	22	1,060	67	1,356	86
Herrenberg, Württemberg	5,537	261	47	219	40	187	34	406	73	667	120

Source: Berlin Data Bank, based on family reconstruction. Rolf Gehrman kindly provided these data.

children reported to have died on their day of birth is equal to it (19 per mill). The Ortenau sample of villages includes several Catholic parishes, whereas the other regions were overwhelmingly Protestant. There the ratio between stillbirths and children who died on their birthday is closer to 3:1, considered to be the average.<sup>35</sup>

For avoiding the problem of distinguishing between stillbirths and infants who died immediately after birth, we can focus on the sum of fetal and (early) neonatal deaths, as a proxy for perinatal mortality. Comparing Table 4 with Tables 1 and 2, we find that in three of the four regions it was clearly lower than in the German maternity hospitals, including Göttingen. This is true even under the assumption that hospitals kept their patients for an average of two weeks after delivery, that is, if we include the deaths in the second week ("total dead" column in Table 4). Only the "best" hospital, the University clinic in Berlin 1817–28, attained the mortality rate (84) of the Ortenau villages (86), though not quite that of East Frisia (73) and Hartum (72). On the other hand, in the "worst" region, that is, the villages surrounding the Württemberg town of Herrenberg, the rate of stillbirths plus deaths in the first two weeks (120) was on the level of maternity hospitals with modest mortality (Leipzig: 117, Göttingen 1791–1829: 128).

The four regions for which we have good data on fetal and (early) neonatal mortality cannot be considered as representative for the whole of Germany, in which infant mortality varied greatly.<sup>36</sup> For broadening the analysis, we have to include data that are less specific. In the Württemberg borough of Laichingen, from the mid-seventeenth century to the late nineteenth century, the stillbirth rate was 44, and another 96 per mill of total births died during the first two weeks of life (42 per mill in the first and 54 per mill in the second week).<sup>37</sup> For some places in other parts of Germany, we have information on stillbirths and neonatal mortality, that is, deaths in the first four weeks of life. In the four regions presented

35. Cf. Gehrman and Roycroft, in Imhof, *Lebenserwartungen* (n. 32), 73. In Hartum the ratio was even more than 7:1, the rate of children who died on their birthday being 5. In Ostfriesland, the latter rate was 12, in Herrenberg 11. Two other regions of the Berlin Data Bank (Schwalm and Saarland) have been excluded from Table 4 because for this period their stillbirth rates are unrealistically low and there is no compensation in the rates of children who died on their birthday.

36. Kloke, "Säuglingssterblichkeit" (n. 32); John E. Knodel, *Demographic Behavior in the Past: A Study of Fourteen German Village Populations in the Eighteenth and Nineteenth Centuries* (Cambridge: Cambridge University Press, 1988), 35–101, 393–442.

37. Calculated from Hans Medick, *Weben und Überleben in Laichingen 1650–1900: Lokalgeschichte als allgemeine Geschichte* (Göttingen: Vandenhoeck, 1996), 371, 618.

in Table 4, stillbirths plus deaths in the first two weeks amounted to 76 percent (Ortenau), 80 percent (Herrenberg), 86 percent (East Frisia), and 87 percent (Hartum) of stillbirths plus neonatal deaths. We may therefore assume that this ratio usually was between 75 and 90 percent. On this basis and under the assumption that on average lying-in hospitals kept their patients for a full fortnight after delivery, we can estimate that in the village of Leezen (Holstein) and in Waldeck villages (central Germany) fetal and (early) neonatal mortality was lower than in most German lying-in hospitals. In Bavarian and most Württemberg villages, it was in the same range as in the clinics. Only in the Württemberg village of Unterwald was it worse.<sup>38</sup>

As a tentative conclusion, these data suggest that in much of northern, central, and western Germany perinatal mortality was lower than in most of the specialized clinics. In maternity hospitals, the risks for fetuses and newborn babies were usually as great as in the regions known for their high perinatal and infant mortality, Württemberg and Bavaria. This means that in the institutions directed by the most reputed obstetricians, fetal and early neonatal mortality was usually no better but often worse than with normal home deliveries, attended by female midwives and other women from the family and neighborhood.

Before going too far in our conclusions, we have to consider potential biases in the comparison. Demographic factors, such as birth rank and maternal age, have an impact on perinatal and neonatal mortality.<sup>39</sup> In both regards the clientele of German lying-in hospitals differed from the bulk of parturients (see below), but the greater share of women bearing the first child was to some extent counterbalanced by the lower proportion

38. Stillbirths plus neonatal deaths in per mill of total born (i.e., live and stillborn) were 79 in Leezen 1770–1819 (Rolf Gehrman, *Leezen 1720–1870: ein historisch-demographischer Beitrag zur Sozialgeschichte des ländlichen Schleswig-Holstein* [Neumünster: Wachholtz, 1984], 142); 80, 88, 95, and 118 in four Waldeck villages in the eighteenth and nineteenth centuries; 136, 138, and 189 in three Bavarian villages in the nineteenth century (Knodel, *Demographic Behavior* [n. 36], 48, cf. 464–65, 492); 181 in the Württemberg village of Kiebingen, 1800–29 (Carola Lipp, “Dörfliche Formen generativer und sozialer Reproduktion,” in Wolfgang Kaschuba and Carola Lipp, *Dörfliches Überleben: zur Geschichte materieller und sozialer Reproduktion ländlicher Gesellschaft im 19. und frühen 20. Jahrhundert*, [Tübingen: Tübinger Vereinigung für Volkskunde, 1982], 549); 168 and 246 in the Württemberg villages of Steinheimerwald and Unterwald, ca. 1820–60 (Gerlinde Sponholz, *Die Säuglingssterblichkeit in zwei ländlichen Gemeinden im 18. und 19. Jahrhundert: konfessionell bedingte Werthaltungen als Risikofaktoren?* [Med. diss., Ulm, 1995], 33–34). These figures have been calculated by me from the data in the sources; only Knodel explicitly gives the figures cited. For comparison with Tables 1, 2, and 4, we have to reduce these figures by 10–25 percent for the deaths occurring during the third and fourth weeks of life.

39. Knodel, *Demographic Behavior* (n. 36), 84–95; Woods, *Death before Birth* (n. 6), 32–33.

of mothers of higher ages. Therefore, other factors are even more important in our context. "Social inequality before death" was pronounced in preindustrial Europe, and it strongly affected infant and perinatal mortality. It was clearly higher for the lower than the upper classes, at least in cities.<sup>40</sup> Usually more fetuses and infants died in towns and cities than in the countryside.<sup>41</sup> Illegitimate infants generally had poorer chances than legitimate offspring.<sup>42</sup> Now, all our data on home deliveries come from rural areas, whereas the clinics were in towns and cities. Moreover, in Table 4 as in most family reconstitutions, illegitimate births are underrepresented.<sup>43</sup> In German lying-in hospitals, the overwhelming majority of patients were not married and poor. This was true of most maternity hospitals on the European continent. In Göttingen, 98 percent of the children born in the clinic were illegitimate, and more than 90 percent of the mothers were servants, either in towns or in the countryside.<sup>44</sup>

40. Alfred Perrenoud, "L'inégalité sociale devant la mort à Genève au XVIIIe siècle," *Population* 30, Numéro spécial "Démographie historique" (1975): 221–43, esp. 233–36; Jean-Pierre Bardet, *Rouen aux XVIIe et XVIIIe siècles: Les mutations d'un espace social* (Paris: Sedes, 1983), 1:370–71; Helga Schultz, "Social Differences in Mortality in the Eighteenth Century: An Analysis of Berlin Church Registers," *Internat. Rev. Soc. Hist.* 36 (1991): 232–48, esp. 241–42.

41. Rolf Gehrmann, *Bevölkerungsgeschichte Norddeutschlands zwischen Aufklärung und Vormärz* (Berlin: Spitz, 2000), 394, 417–18, 424, 426, cf. 253–54.

42. Kloke, "Säuglingssterblichkeit" (n. 32), 122–27; Beate Harms-Ziegler, *Illegitimität und Ehe: Illegitimität als Reflex des Ehediskurses in Preussen im 18. und 19. Jahrhundert* (Berlin: Duncker & Humblot, 1991), 391–94; Woods, *Death before Birth* (n. 6), 39–40, 63n9, 79; Alysa Levene, "The Mortality Penalty of Illegitimate Children: Foundlings and Poor Children in Eighteenth-century England," in *Illegitimacy in Britain, 1700–1920*, ed. Alysa Levene et al. (Basingstoke: Palgrave Macmillan, 2005), 34–49; Edward A. Wrigley et al., *English Population History from Family Reconstitution 1580–1837* (Cambridge: Cambridge University Press, 1997), 220–22; Anders Brändström, "Life Histories of Single Parents and Illegitimate Infants in Nineteenth-Century Sweden," *Hist. Fam.* 1 (1996): 205–26; Jan Kok et al., "Mortality among Illegitimate Children in Mid-Nineteenth-Century The Hague," in *The Decline of Infant and Child Mortality: The European Experience, 1750–1990*, ed. Carlo A. Corsini and Pier Paolo Viazzo (The Hague: Nijhoff, 1997), 193–211.

43. Gehrmann and Roycroft, in Imhof, *Lebenserwartungen* (n. 32), 62–65, 69–70.

44. Schlumbohm, "Verheiratete und Unverheiratete" (n. 8), 330–31; Seidel, *Eine neue "Kultur"* (n. 1), 164–89; Marita Metz-Becker, *Der verwaltete Körper: Die Medikalisierung schwangerer Frauen in den Gebärdhäusern des frühen 19. Jahrhunderts* (Frankfurt: Campus, 1997), 149–59; Susanne Preussler, *Hinter verschlossenen Türen: Ledige Frauen in der Münchner Gebärdanstalt, 1832–1853* (Munich: Vereinigung für Volkskunde, 1985), 110–15; cf. Pawlowsky, *Mutter ledig* (n. 26), 69–93; Beauvalet-Boutouyrie, *Naitre* (n. 11), 74–76, 142–50; Sandra Cavallo, *Charity and Power in Early Modern Italy: Benefactors and Their Motives in Turin, 1541–1789* (Cambridge: Cambridge University Press, 1995), 199–201; Andreas Renner, *Russische Autokratie und europäische Medizin: organisierter Wissenstransfer im 18. Jahrhundert* (Stuttgart: Steiner, 2010), 125–26.

As a corollary of these mothers' disadvantages, there was a rather high proportion of babies with low birth weight. Professor Osiander followed the example given by his predecessor Roederer, who is regarded as the first birth attendant who systematically weighed and measured the neonates.<sup>45</sup> From Osiander's diaries, we can calculate that, in the Göttingen clinic 1795–1814, the mean birth weight was 3,099 grams (approx. 6 pounds 13 ounces), the mean length 47.9 centimeters (approx. 19 inches). Of the neonates, 11.6 percent weighed less than 2,500 grams, out of whom 4.8 percent less than 2,000 grams and 2.1 percent even less than 1,500 grams. On the other hand, 65.0 percent were between 2,500 and 3,500 grams, and 23.4 percent more. In Roederer's time, there were 12.6 percent below 2,500 grams, and mean weight amounted to 3,035 grams (approx. 6 pounds 11 ounces).<sup>46</sup> Such a high proportion of babies with low birth weight was not unusual in European hospitals in the nineteenth century. In our days, we find it rather in developing countries.<sup>47</sup> Out of the children born 1795–1814 weighing less than 2,500 grams, only 56.1 percent left the Göttingen clinic alive, whereas 90.7 percent of the heavier ones did so. Twins were smaller than singletons. In the Göttingen hospital, 80.8 percent of the twins were less than 2,500 grams, and only 56.7 percent of all twins survived until their mother was discharged.

On balance, given the higher risks of illegitimate and poor children, it would be unfair to lay all the blame for the above-average fetal and (early) neonatal mortality of hospitals on the institutions themselves. On the other hand, our data do not confirm that the Göttingen clinic or other German maternity hospitals fulfilled the promise to save children's lives.

## Obstetric Art and Maternal Mortality

During the thirty-eight years from 1791 to 1829, more than 3,500 deliveries took place in Göttingen lying-in hospital. In all, 47 women died before, during, or after giving birth, that is, the maternal mortality rate was 132

45. Osiander, *Literarische und pragmatische Geschichte* (n. 1), 324–25; James M. Tanner, *A History of the Study of Human Growth* (Cambridge: Cambridge University Press, 1981), 96–97; W. Peter Ward, *Birth Weight and Economic Growth: Women's Living Standards in the Industrializing West* (Chicago: University of Chicago Press, 1993), 22.

46. Calculated from the data for 111 newborns, in Johann Georg Roederer, "De temporum in graviditate et partu aestimatione," in Roederer, *Opuscula medica* (Göttingen: Bossiegel, 1764), 2:29–70, esp. 34–38, 48. Roederer appears to have used Göttingen weight (1 pound = 486.4 g). Osiander used Württemberg weight (1 pound = 467.7 g) and Paris inches (1 inch = 2.707 cm).

47. Ward, *Birth Weight* (n. 45); Beauvalet-Boutouyrie, *Naître* (n. 11), 263ff.; *Low Birthweight: Country, Regional and Global Estimates* (New York: UNICEF, World Health Organization, 2004).

per 10,000 deliveries (Table 5).<sup>48</sup> This means that infants (or fetuses) died ten times more frequently than mothers did. The 47 deaths were distributed very unevenly across the years and decades. In 1793 and 1826 the hospital lost 4 patients, and in 1806, the worst year, 7, whereas in thirteen years there were no maternal deaths; the mode was one per year. The first director, Roederer, had lost 5 of the 232 women delivered 1751–62, that is, 216 per 10,000.

Were hazardous operations a factor in maternal mortality? It is true that Osiander did not oppose operations that put the woman's life at risk as peremptorily as those that the fetus could not survive. But a Cesarean section was only the last resort, which was done three times (1805, 1806, 1825) on women with extremely narrow pelvises, where neither forceps nor podalic version worked. In 1807 another abdominal delivery was done in the case of an extrauterine pregnancy, apparently three months overdue.<sup>49</sup> Although no woman and no child survived after these operations, they were too infrequent to be considered a major contribution to mortality.

On the women who were seriously ill and died, the director entered a case history into the diary, and did a postmortem. Rather rarely did he speak of "childbed fever." Taking part in the Europe-wide controversies about this malady,<sup>50</sup> he narrowed down the concept, distinguished between hot and cold puerperal fever,<sup>51</sup> and preferred to give, as causes of death, "peritonitis," "metritis," or "inflammation of the abdomen." The four deaths and three healed "inflammations in the lower part of the body" that the Göttingen hospital saw from February to April 1793<sup>52</sup> would probably be called an epidemic of puerperal fever by a modern observer. Possibly, other mortality peaks had the same cause.

48. In addition, four women who were not pregnant but were treated and operated for "cancer" or "dropsy" died in the hospital.

49. On the debate about Cesarean section: Gélis, *La sage-femme* (n. 11), 361–72, 378–83; Nadia Maria Filippini, *La nascita straordinaria: Tra madre e figlio la rivoluzione del taglio cesareo, sec. XVIII–XIX* (Milan: Angeli, 1995); Irntraut Sahmland, "Alternativen zum Kaiserschnitt: medizinhistorische Untersuchung zur Sectio caesarea, Embryotomie, Symphyseotomie und künstlichen Frühgeburt im 18. und 19. Jahrhundert" (Med. Habilitationsschrift Gießen, 1997).

50. Margaret DeLacy, "Puerperal Fever in Eighteenth-Century Britain," *Bull. Hist. Med.* 63 (1989): 521–56; Loudon, *Death in Childbirth* (n. 4), 49–84; Irvine Loudon, ed., *Childbed Fever: A Documentary History* (New York: Garland, 1995); Irvine Loudon, *The Tragedy of Childbed Fever* (Oxford: Oxford University Press, 2000); Murphy-Lawless, *Reading Birth* (n. 3), 105–57; Christine Hallett, "The Attempt to Understand Puerperal Fever in the Eighteenth and Early Nineteenth Centuries: The Influence of Inflammation Theory," *Med. Hist.* 49 (2005): 1–28.

51. Friedrich Benjamin Osiander, *Beobachtungen, Abhandlungen und Nachrichten* (Tübingen: Cotta, 1787), 19–36, 70–113.

52. Osiander, *Denkwürdigkeiten* (n. 24), vol. 1, pt. 1, 101–224.

Table 5. Maternal mortality at Göttingen lying-in hospital, 1751–62 and 1791–1829 (rate per 10,000 deliveries)

Years	Deliveries	Women died	
	<i>n</i>	<i>n</i>	Rate
1751–62	232	5	216
1791–99	671	10	149
1800–09	830	18	217
1810–19	879	8	91
1820–29	1,181	11	93
Total 1791–1829	3,561	47	132

Sources: As Table 1.

Note: The mortality figures for 1751–62 are the minimum, since for 92 patients the source does not explicitly state whether or not they left the hospital alive; nevertheless, here they have been counted as surviving, not as missing.

In other lying-in hospitals, such epidemics were more frequent and more devastating, especially in large and overcrowded facilities. The maternity ward of the Paris Hôtel-Dieu was notorious for them, and the Maternité de Port-Royal, newly instituted in the 1790s, had a similar experience. In the hospitals of London and Vienna, childbed fever raged from time to time, and small institutions as the one in Kassel were not spared. These epidemics multiplied the number of dying patients, compared to “normal” years.

Over longer periods, too, in certain clinics maternal mortality was much worse than in Göttingen; in most it was on a similar level, in some it was lower (Table 6). Everywhere, it fluctuated from year to year, and from decade to decade.<sup>53</sup> Interestingly, the figures on maternal deaths do not always go into the same direction as those on perinatal deaths (Tables 2 and 3). Berlin University clinic, for example, which lost remarkably few fetuses and babies, was less successful at saving mothers’ lives.

It is not certain, however, that the data on maternal mortality are all reliable and exactly comparable across institutions and periods. As mentioned, for most hospitals it is unknown how long mothers stayed after

53. Cf. Seidel, *Eine neue “Kultur”* (n. 1), 200–17; Loudon, *Death in Childbirth* (n. 4), 196–203, 428–44; DeLacy, “Puerperal Fever” (n. 50); Woods, *Death before Birth* (n. 6), 91–93; Woods, “Lying-in” (n. 6), 738–42. Putting aside the years of epidemics, as Cody, “Living and Dying” (n. 5), 342 (cf. the quotation in the introduction, above) seems to suggest, is problematic.

Table 6. Maternal mortality at several lying-in hospitals, late eighteenth century to early nineteenth century (rate per 10,000 deliveries)

Hospital, place	Years	Deliveries <i>n</i>	Women died <i>n</i>	Rate	
British Lying-in Hospital, London	1750–59	3,761	84	223	
	1760–69	4,862	95	195	
	1770–79	5,639	102	181	
	1780–89	5,549	89	160	
	1790–99	5,971	21	35	
	Total	1750–99	25,782	391	152
Rotunda Hospital, Dublin	1757–69	6,676	98	147	
	1770–79	7,747	88	114	
	1780–89	12,258	117	95	
	1790–99	16,046	132	82	
	1800–11	27,596	268	97	
	Total	1757–1811	70,323	703	100
Hôtel-Dieu, Paris	1776–86	17,876*	1,142	639	
	1802–09	833	36	432	
	1810–19	658	34	517	
	1820–29	1,757	81	461	
	Total	1802–29	3,248	151	465
	Port-Royal, Paris	1802–09	15,307	610	399
1810–19		23,484	1,114	474	
1820–29		25,895	1,293	499	
Total		1802–29	64,686	3,017	466
Vienna	1784–89	6,412*	41	64	
	1790–99	17,574*	173	98	
	1800–09	17,438*	139	80	
	1810–19	20,613*	388	188	
	1820–29	28,311*	1,231	435	
	Total	1784–1829	90,348*	1,972	218
Kassel	1763–81	1,533	25	163	
Munich	1782–1826	8,422	79	94	
Marburg	1792–1807	1,100	17	155	
Hamburg	1796–1828	2,882	39	135	
Jena	1797–1830	861	15	174	
Kiel	1805–32	2,573	22	86	
Leipzig	1810–30	1,632	15	92	
Dresden	1814–27	2,515	69	274	
University, Berlin	1817–28	1,818	29	160	
Heidelberg	1819–25	1,685	15	89	
Würzburg	1821–29	1,343	15	112	



Table 6. Continued

\* Number of children born (including stillbirths), not number of deliveries. Assuming that there was one twin birth per 80 deliveries, the value in the last column should be multiplied by 1.013.

Sources: As for Tables 2–3, and as follows: Paris: LeFort, *Des maternités* (n. 77), 24–25, 27–28; except for Hôtel-Dieu, 1776–86: Jacques René Tenon, *Mémoires sur les hôpitaux de Paris* (Paris: Pierres, 1788), 260–66. Vienna: Fischer, *Geschichte* (n. 11), 486. Marburg: Georg Wilhelm Stein d. J., *Annalen der Geburtshülfe*, vol. 1 (Leipzig: Barth, 1808), 26. Jena: Martin, *Die Gebäranstalt* (n. 27), 18–19, 23, 32, 58. Kiel: Gustav A. Michaelis, “Geschichte der Kieler Hebammen- und Gebäranstalt.” *Mitteilungen aus dem Gebiete der Medizin, Chirurgie und Pharmazie* 1 (1832): 127–44, esp. 133 (table). Heidelberg: Franz C. Nägele, “Übersicht der Vorfälle in der Entbindungsanstalt von den Jahren 1819 bis 1824 einschließlich,” *Heidelberger Klinische Annalen* 1 (1825): 493–506, esp. 506; Nägele, “Übersicht . . . 1825 bis 1826,” *Heidelberger Klinische Annalen* 3 (1827): 481–96, esp. 481–82. Würzburg: Joseph d’Outrepoint, “Übersicht der Vorfälle in der Entbindungsanstalt zu Würzburg in den Jahren 1821 und 1822,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 2 (1828): 163–81, esp. 163–64; d’Outrepoint, “Übersicht . . . 1823 und 1824,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 2 (1828): 182–94, esp. 182; d’Outrepoint, “Übersicht . . . 1825 und 1826,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 3 (1828): 112–25, esp. 112–13; d’Outrepoint, “Übersicht . . . 1827,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 3 (1828): 598–609, esp. 598; d’Outrepoint, “Übersicht . . . 1828,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 4 (1829): 563–77, esp. 563–64; d’Outrepoint, “Übersicht . . . 1829,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 5 (1830): 640–47, esp. 640–41.

birth, that is, how long they were under observation. Even more disturbing is that there are reports that some lying-in clinics transferred sick women to other wards or institutions. In this way, an eventual death would not show up in the figures published by the maternity hospital. This practice is mentioned in Vienna, Munich, Hamburg, and Würzburg.<sup>54</sup> How often this happened cannot be ascertained without detailed archival studies. One may imagine that it was easy where the lying-in facility was just a ward of a general hospital, as in Vienna and Würzburg. At Göttingen, there are no signs of such occurrences. Often Osiander kept sick lying-in women until they recovered or died. Of the forty-seven mothers who died, fourteen died more than two weeks after giving birth, three more than a month later.

54. Fischer, *Geschichte* (n. 11), 140, 194; Loudon, *Tragedy* (n. 50), 93; Martin, *Geschichtliche Darstellung* (n. 24), 176, 178; Homann, “Die Entbindungsanstalt zu Hamburg” (n. 24), 183; Joseph d’Outrepoint, “Übersicht der Vorfälle in der Entbindungsanstalt zu Würzburg in den Jahren 1821 und 1822,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 2 (1828): 163–81, esp. 165; d’Outrepoint, “Übersicht . . . 1825 und 1826,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 3 (1828): 112–25, esp. 113; d’Outrepoint, “Übersicht . . . 1827,” *Gemeinsame deutsche Zeitschrift für Geburtskunde* 3 (1828): 598–609, esp. 598.

Comparing the losses of women in lying-in hospitals to the mortality in general populations will help to assess the performance of specialized institutional care. What is striking in Table 7 is that in many regions, towns, and cities maternal mortality appears not to have been higher than, but on a similar level as or even lower than, in hospitals during the same period.

There are, however, some methodological and data problems involved in this comparison. The data in Table 7 are all based on lists of causes of death. From the eighteenth century, several German states, regions, cities, and towns regularly produced these data, as well as those on live and stillbirths. Although it cannot be proven that all incumbents of parish registers, whose notices these lists united, were equally diligent and defined the terms "died in childbed" and "died in labor" exactly in the same way, maternal mortality statistics based on causes of death are considered as rather reliable.<sup>55</sup> But the small minority of women who delivered in hospitals had some characteristics that distinguished them from those who gave birth at home. With regard to mortality, this may be the source of a bias. Since almost all hospital births in Continental Europe were illegitimate, there was a high proportion of first births among them. In the Göttingen facility, 59 percent of all women were in their first pregnancy, in other German hospitals 43 to 62 percent during this period,<sup>56</sup> whereas in preindustrial European populations approximately 20 to 25 percent appears to have been normal for the share of first parities in all births.<sup>57</sup> It is well known that the first birth is usually more dangerous than subsequent deliveries. In six west German villages during the eighteenth and nineteenth centuries, maternal mortality in first births was approximately 24 percent higher than the mean. In eighteenth-century rural France, the difference was 38 percent, and according to family reconstitutions for England and Wales even 45 percent.<sup>58</sup> On the other hand, the proportion of young women was bigger in hospitals than in general. In Göttingen, the average age given by the patients on admission was twenty-six years,

55. Roger S. Schofield, "Did Mothers Really Die?," in *The World We Have Gained: Histories of Population and Social Structure*, ed. Lloyd Bonfield et al. (Oxford: Blackwell, 1986), 231–60, esp. 232; cf. Ulf Högberg, *Maternal Mortality in Sweden* (Umeå: University of Umeå, 1985), 8, 29–30.

56. Seidel, *Eine neue "Kultur"* (n. 1), 182.

57. From Wrigley et al., *English Population History* (n. 42), 321, a rate of 26 percent can be calculated; Hector Gutierrez and Jacques Houdaille, "La mortalité maternelle en France au XVIIIe siècle," *Population* 38 (1983): 975–93, esp. 986: 21 percent.

58. Knodel, *Demographic Behaviour* (n. 36), 108 (table), 111 (figure); Gutierrez and Houdaille, "La mortalité maternelle" (n. 57), 987; Wrigley et al., *English Population History* (n. 42), 321.

Table 7. Maternal mortality in German regions, cities, and towns, late eighteenth century to early nineteenth century (rate per 10,000 deliveries)

Place	Years	Deliveries <i>n</i>	Women died <i>n</i>	Rate	
<i>Cities and towns</i>					
Berlin	1758–63	22,902*	241	105	
	1764–69	26,656*	321	120	
	1770–74	19,465*	234	120	
Total	1758–74	69,023*	796	115	
	1784–94	52,004*	361	69	
	1794–1805	68,271*	444	65	
Total	1784–1805	120,275*	805	67	
	1819–22	26,570	174	65	
	1759–63	5,034*	92	183	
Leipzig	1764–68	5,169*	82	159	
	1769–74	5,563*	71	128	
	1775–79	4,718*	70	148	
	1780–84	4,840*	69	143	
	Total	1759–84	25,324*	384	152
		1769–73	11,125*	127	114
Königsberg	1774–83	20,636*	272	132	
	1784–93	17,909*	174	97	
	1794–1803	18,442*	149	81	
	1804–14	24,353*	181	74	
	Total	1769–1814	92,465*	903	98
Northeim	1758–75	1,630*	14	86	
<i>Regions</i>					
140 villages in Altmark	1766–74	5,504*	69	125	
Kurmark					
Brandenburg	1789–98	258,183*	2,682	104	
Neumark					
Brandenburg	1789–98	101,978*	1,021	100	
Ravensberg	1782–92	26,529*	339	128	
Mecklenburg-Schwerin (part)	1777–80	4,496	49	109	
	1781–85	8,196	113	138	
Total	1777–85	12,692	162	128	
Mecklenburg-Schwerin	1786–90	52,859	657	124	
	1791–95	56,134	641	114	

Table 7. Continued

Place	Years	Deliveries	Women died	
		<i>n</i>	<i>n</i>	Rate
Mecklenburg-Schwerin	1796–1800	61,965	627	101
	1801–05	65,645	643	98
	1806–10	63,285	652	103
	1811–15	68,693	665	97
	1816–20	70,374	634	90
	1821–25	76,916	565	73
	1826–30	77,843	701	90
	Total	1786–1830	593,714	5,785

\* Number of children born (including stillbirths), not number of deliveries. Assuming that there was one twin birth per 80 deliveries, the value in the last column should be multiplied by 1.013.

Source: Boris Schaefer, "Die Wöchnerinnensterblichkeit im 18. Jahrhundert" (Med. diss., Berlin, 1923), 22, 27–28, 34, 36–37, 40–42, 47, 49, 51–53, 55–56, 73.

and only 6 percent were thirty-five or older.<sup>59</sup> In preindustrial Europe, approximately 30 percent of women giving birth appear to have been thirty-five years or older.<sup>60</sup> The risk of dying usually increases with age. In England and Wales, it was 14 percent above average for parturients older than thirty-four, in rural France 25 percent.<sup>61</sup>

Whatever the net effect of age and parity on the mortality in hospitals was,<sup>62</sup> there is another factor whose influence was much greater. In preindustrial Europe, six weeks appear to have been considered as the normal period of "lying-in," and modern definitions of maternal deaths, too, address forty-two days from the termination of pregnancy.<sup>63</sup> In the

59. Schlumbohm, "Verheiratete und Unverheiratete" (n. 8), 330–32.

60. From both Wrigley et al., *English Population History* (n. 42), 323, and Gutierrez and Houdaille, "La mortalité maternelle" (n. 57), 982, a rate of 29 percent can be calculated; Högberg, *Maternal Mortality* (n. 55), 15 (figure), also indicates a value near 30 percent for Sweden 1750–1850.

61. Rates calculated, weighted by number of births in these age groups, from Wrigley et al., *English Population History* (n. 42), 323; Gutierrez and Houdaille, "La mortalité maternelle" (n. 57), 982; cf. Knodel, *Demographic Behavior* (n. 36), 111 (figure).

62. Cf. Knodel, *Demographic Behavior* (n. 36), 113; Loudon, *Death in Childbirth* (n. 4), 502–6; Högberg, *Maternal Mortality* (n. 55), 59–70.

63. Wrigley et al., *English Population History* (n. 42), 309; Högberg, *Maternal Mortality* (n. 55), 8.

Göttingen hospital, as we have seen, patients stayed only two weeks after giving birth, and in other facilities the period may have been shorter. For this reason, some deaths in childbed must be missing in the hospital statistics. The few data available suggest that the number of deaths observed during pregnancy, birth, and the first *two* weeks after must be multiplied by 1.21 for covering all maternal deaths. If the period under observation finishes one week after delivery, the mortality figures should even be multiplied by 1.49.<sup>64</sup>

This means that German lying-in hospitals had in fact a maternal mortality that was not better, but in many cases worse than in normal home deliveries. It is striking to compare the record of the Göttingen hospital with that of the nearby town of Northeim in the late eighteenth century or the clinic of Berlin University with the city at large in the early nineteenth (Tables 5–7).<sup>65</sup> These examples suggest that hospitals may well have lost twice as many mothers as ordinary midwives attending home deliveries. This is, incidentally, what has been found to be true for the French city of Rouen and its Hôtel-Dieu in the second half of the eighteenth century.<sup>66</sup>

The dangers of maternity hospitals did not pass unnoticed by medical experts of the late eighteenth century. As about general infirmaries, there was a Europe-wide debate about the pros and cons of lying-in hospitals.<sup>67</sup> Several British and continental doctors found higher maternal mortality with in-patients than with home deliveries, mainly due to epidemics of puerperal fever. The hospital directors argued, however, that their specific clientele was the main reason for the high mortality: Because of their poverty und disorderly lives, these women were particularly susceptible to all kinds of diseases, and many were already ill when admitted. Linking class, gender, and morality, this defensive strategy was persuasive to many in the educated public.<sup>68</sup>

64. Calculated from Schofield, “Did Mothers Really Die?” (n. 55), 243; Wrigley et al., *English Population History* (n. 42), 311.

65. Gehrman, *Bevölkerungsgeschichte Norddeutschlands* (n. 41), 141, gives a maternal mortality rate of 58 per 10,000 for the city of Berlin 1820–34.

66. Bardet, *Rouen* (n. 40), 1:366.

67. See Jürgen Schlumbohm, “Did the Medicalisation of Childbirth Reduce Maternal Mortality in the Eighteenth and Nineteenth Centuries? Debates and Data from Several European Countries,” in *Historical Studies in Mortality Decline*, ed. William H. Hubbard et al. (Oslo: Novus, 2002), 96–112, also for what follows.

68. Friedrich Benjamin Osiander, *Anzeige seiner Vorlesungen im Sommerhalbenjahr 1793* (Göttingen, 1793), 39; cf. Murphy-Lawless, *Reading Birth* (n. 3), 137–42; Beauvalet-Boutouyrie, *Naitre* (n. 11), 240–43; Cody, “Living and Dying” (n. 5), 338–39; Seidel, *Eine neue “Kultur”* (n. 1), 209–10.

Detailed research from the second half of the nineteenth and first half of the twentieth centuries, however, came to the conclusion that maternal mortality depended much less on socioeconomic conditions than infant mortality did, and that the standard of obstetric care was the main reason for differences in the number of mothers dying.<sup>69</sup> The best care was not necessarily provided by the most expensive attendants and prestigious institutions; on the contrary, too much interference and frequent internal explorations increased the risks. Studies on the late eighteenth and early nineteenth centuries have also shown that social class was not a major determinant of the number of deaths in childbed.<sup>70</sup> Contrary to fetal and infant mortality, some cities had lower levels of maternal mortality than the countryside.<sup>71</sup> This is true, for example, for Berlin and the surrounding Kurmark (Table 7).

Moreover, lying-in hospitals did not select, or particularly attract, high-risk patients before the late nineteenth century or even twentieth century.<sup>72</sup> Very rarely did a pregnant woman go to a clinic because she anticipated birth complications. Emergency hospitalization during labor happened only in exceptional cases. In the diaries of the Göttingen clinic, a single case of this kind could be found.<sup>73</sup> If difficulties arose during a birth, the hospital director or other specialist was rather called to the parturient's home.

## Conclusions and More Questions

In sum, the available data do not confirm that the Göttingen clinic, or other early German lying-in hospitals, achieved a lower perinatal or maternal mortality than ordinary midwives in home deliveries. It is noteworthy that many of the statistics were published already in the eighteenth and early nineteenth centuries. The enlightened public was aware of the dangers posed by hospitals to the lives of parturients, whereas fetal and neonatal mortality were discussed much less in this context. Why then were maternity hospitals founded and maintained in more and more

69. Loudon, *Death in Childbirth* (n. 4), 243–46, 492–96, cf. 44–48.

70. Bardet, *Rouen* (n. 40), 1:366; Jürgen Schlumbohm, *Lebensläufe, Familien, Höfe: Die Bauern und Heuerleute des Osnabrückischen Kirchspiels Belm in proto-industrieller Zeit, 1650–1860* (Göttingen: Vandenhoeck, 1994), 163.

71. Cf. Gehrman, *Bevölkerungsgeschichte Norddeutschlands* (n. 41), 141–42; Edward Shorter, *A History of Women's Bodies* (New York: Basic Books, 1982), 99–100.

72. Seidel, *Eine neue "Kultur"* (n. 1), 171–74; Loudon, *Death in Childbirth* (n. 4), 223–24, 430.

73. TgB, vol. 11, no. 105 (1808–9).

German cities and towns? This is a puzzling question, especially in comparison with Britain, where, from the mid-eighteenth century, outpatient charities became an attractive alternative to both parturient women and benefactors. Not only were they cheaper, but they also fared much better in terms of maternal mortality.<sup>74</sup>

Already in the eighteenth century, critics admitted that hospitals, in spite of their shortcomings, had two major advantages. John Aikin stated in 1771 that they “promote the benefit of the healing art, both by affording advantages for education, and giving opportunities for experimental practice.”<sup>75</sup> In Germany, one university after the other founded a lying-in clinic, following the example of Göttingen. Their main purpose was to offer practical training to medical students. In addition, many gave courses to female midwives. Outside of universities, most German lying-in hospitals were founded for instructing midwives.<sup>76</sup> Almost all of them were financed by public money, and this explains why the educational purpose had top priority. In addition, the directors, who were all medical men, sought to contribute to the progress of their discipline by trying innovative methods and publishing interesting cases. In this way, they accumulated expert knowledge, coded in the language of medical science. Soon governments and an educated public recognized them as the leading authorities in the field—in spite of the published mortality figures of their institutions, and although in the middle of the nineteenth century, maternal mortality in lying-in hospitals became even worse.<sup>77</sup> In Germany, lying-in hospitals and the obstetricians who directed them may well have been leaders in generating expert knowledge and providing obstetric education.<sup>78</sup> In saving children’s and mothers’ lives, however, they were less successful than midwives in cities, towns, and villages. At best, it could be argued that they contributed to falling mortality in an indirect way: by

74. Bronwyn Croxson, “The Foundation and Evolution of the Middlesex Hospital’s Lying-in Service, 1745–86,” *Soc. Hist. Med.* 14 (2001): 27–57, esp. 45–53; Wilson, *Making of Man-Midwifery* (n. 11), 197–98; Loudon, *Death in Childbirth* (n. 4), 193–203. For a rare German counterpart, see Mary Lindemann, “Maternal Politics: The Principles and Practice of Maternity Care in Eighteenth-Century Hamburg,” *J. Fam. Hist.* 9 (1984): 44–63, esp. 51–55.

75. John Aikin, *Thoughts on Hospitals* (London: Johnson, 1771), 71.

76. Axel Karenberg, “Lernen am Bett der Schwangeren: zur Typologie des Entbindungshauses in Deutschland (1728–1840),” *Zentralblatt für Gynäkologie* 113 (1991): 899–912; Karenberg, *Lernen am Bett der Kranken: die frühen Universitätskliniken in Deutschland (1760–1840)* (Hürtgenwald: Pressler, 1997); Seidel, *Eine neue “Kultur”* (n. 1), 239–312.

77. Loudon, *Death in Childbirth* (n. 4), 196–203, 428–34; Léon LeFort, *Des maternités* (Paris, 1866).

78. Siebold, *Versuch einer Geschichte* (n. 2), 2:705–6, praised maternity hospitals for these two reasons.

the new knowledge that they produced or received through international exchange, they were able to give a better education to midwives, and to doctors who in turn instructed midwives.

This is in fact what has been argued with regard to several European countries, especially for the second half of the nineteenth century.<sup>79</sup> It would be useful if this hypothesis could be verified by directly comparing the mortality of births attended by midwives or male practitioners who were instructed by medical institutions on the one hand and by “traditional” matrons on the other. Rarely has this been done so far, and the results are not always as clear as one might expect.<sup>80</sup> Although much valuable research has been done on the history of childbirth and midwifery in the past few decades, important questions still remain to be answered, and for some of the more intriguing issues in-depth studies using comprehensive archival documentation and individual-level data appear to be required.



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79. Ulf Högberg, “The Decline in Maternal Mortality in Sweden: The Role of Community Midwifery,” *Amer. J. Pub. Health* 94 (2004): 1312–20, esp. 1316–17; cf. Högberg, *Maternal Mortality* (n. 55); Stephan Curtis, “Midwives and Their Role in the Reduction of Direct Obstetric Deaths during the Late Nineteenth Century: The Sundsvall Region of Sweden (1860–1890),” *Med. Hist.* 49 (2005): 321–50; Loudon, *Death in Childbirth* (n. 4), 406–15; Anne Løkke, “Did Midwives Matter? 1787–1845,” in *Pathways of the Past: Essays in Honour of Sølvi Sogner*, ed. Hilde Sandvik et al. (Oslo: Novus, 2002), 59–72; Vincent de Brouwere, “The Comparative Study of Maternal Mortality over Time: The Role of the Professionalisation of Childbirth,” *Soc. Hist. Med.* 20 (2007): 541–62.

80. Scarlett Beauvalet-Boutouyrie and Jacques Renard, “Des sages-femmes qui sauvent les mères? 1777–1807,” *Histoire, économie et société* 13 (1994): 269–90, confirm the hypothesis for a district in Normandy, France. On the other hand, an inquiry in the duchy of Oldenburg 1780 and data from East Prussia in the late nineteenth century do not show significant differences in mortality between births attended by examined midwives and uninstructed matrons: Brigitte Menssen and Anna-Margarete Taube, “Hebammen und Hebammenwesen in Oldenburg,” in *Regionalgeschichte: Probleme und Beispiele*, ed. Ernst Hinrichs and Wilhelm Norden (Hildesheim: Lax, 1980), 165–224, esp. 179–88; Philipp Ehlers, *Die Sterblichkeit “im Kindbett” in Berlin und in Preussen 1877–1896* (Stuttgart: Enke, 1900), 6–7, 120.