

Analysis of the impact of environmental factors on maternal mortality and stillbirth rates in 19th century Rochester.

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Background

Through careful analysis it was found that environmental factors such as ambient air pollution, air pollution in outdoor environments have an effect on maternal mortality and stillbirth rates. A study that was conducted in an industrialized area concluded that "increases in the mean concentrations of nitrogen dioxide, and sulfur dioxide in the first trimester, carbon monoxide in the second trimester, and CO₂ and SO₂ in the third trimester were associated with increased risks of stillbirth"(Faiz,pp1). All these gases are similar to the ones released by factories in industrialized areas. Much like today air pollution was an ever growing problem in 19th century Rochester as more and more factories began to emerge. Furthermore in the 19th century little was known about air pollution so not much was being done to decrease the risks associated with it. As air pollution remained a problem "because of physiologic changes in pregnancy, pregnant women and their fetuses are among the most vulnerable"(Hackley,pp1) for being affected by these increases in air pollution. In the 19th century the Genesee river valley powered the mills which caused a great deal of people to move to Rochester. In turn factories and industrial life was on the rise and therefore so was pollution. These factories eventually turned to other sources of power and by " the end of the 19th century and it became possible to use coal power and electric power"(Butler). These new sources of power only further contributed to air pollution and in turn maternal mortality and stillbirth rates continued to remain high. It is with this information that I am determining the impacts that environmental factors have on maternal mortality and stillbirth rates in 19th century Rochester.

Methods

Collection of data

- ❖ The data represents the stillbirth and maternal mortality rates in 19th Century Rochester
- ❖ The data was collected from Mount Hope cemetery
- ❖ The data was transcribed by hand
- ❖ The data was collected online from Rush Rhees Library of the University of Rochester

Data Organization

- ❖ The data is further broken down by ward of residency.
- ❖ The total number of stillbirths used in this sample was 500 and the total number of maternal deaths that used was 100.
- ❖ The data meeting the necessary criteria (stillbirth and maternal mortality)was extracted from a larger set of data which contained a total of around 12,000 entries
- ❖ The total number of stillbirth rates per ward of residency was inputted into excel and plotted
- ❖ The total number of maternal mortalities per ward was calculated and then put into excel where the data was plotted for graphical representation

Mapping Out The Data

- ❖ An 1895 map of Rochester was utilized as a reference for the different areas of residency in which stillbirths and maternal mortality occurred most frequently
- ❖ The map provided data on where stillbirth rates and maternal mortality rates were highest
- ❖ The data was broken up by frequency per ward in which maternal mortality and stillbirths occurred

Figure 1

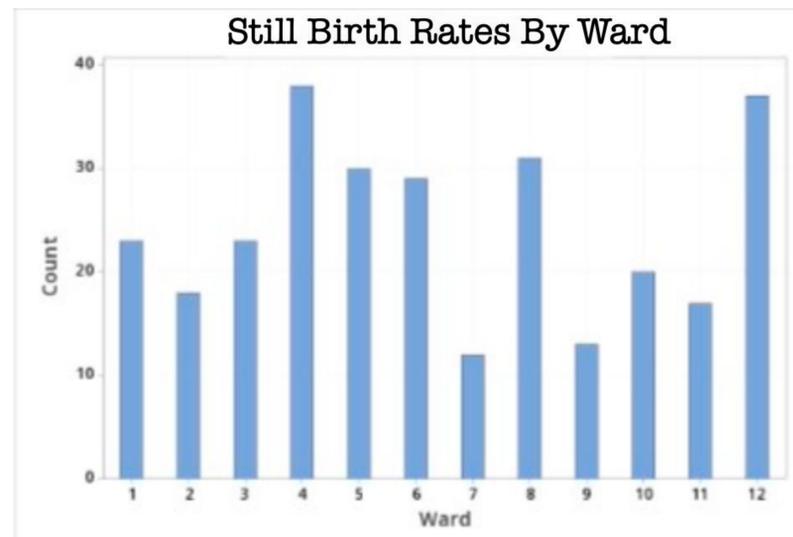
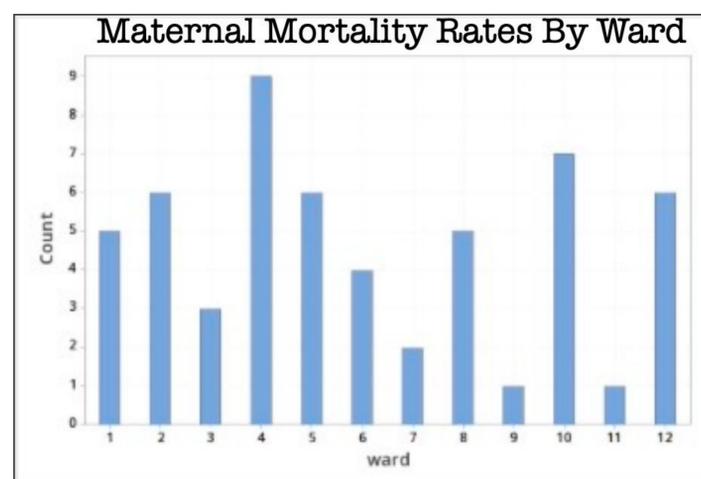


Figure 2



Figure 3



Results

- ❖ Figure 1 shows the frequency of stillbirths by ward in which the incident occurred
- ❖ Figure 2 shows the map which was referenced for determining the wards and their proximity to industrial areas such as the Genesee river
- ❖ Figure 3 shows the frequency of maternal mortality by ward in which the incident occurred
- ❖ The East side of the river in wards 5 and 6 here was worse outcomes for stillbirths than the west side of the river did
- ❖ Wards 4 and 12 had worse outcomes for both maternal mortality and stillbirth rates
- ❖ In wards 7,9 and 11 all of which are located further away from the center of downtown had better outcomes in terms of maternal mortality and stillbirth rates

Conclusion

There is a connection between stillbirth and maternal mortality rates and environmental factors. Given the data presented it can be concluded that environmental factors such as pollution put out by factories contributed to higher rates of both still births and maternal mortality in late 19th century Rochester. It is seen that the wards located closer to the Genesee river had higher rates of both maternal mortality and stillbirths compared to the wards located farther away from the river. Given that many of the factories and mills in 19th century Rochester were located on or near the Genesee river there is evidence to support my claim that environmental factors influenced maternal mortality and stillbirth rates.

References

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