

'INSTANCES OF THE COMMUNICATION OF CHOLERA THROUGH THE MEDIUM OF POLLUTED WATER IN THE NEIGHBORHOOD OF BROAD STREET, GOLDEN SQUARE' BY JOHN SNOW

In this excerpt from his book describing the discovery of the source of transmission for cholera in London, the "father of epidemiology," John Snow, describes the processes he used.

The most terrible outbreak of cholera which ever occurred in this kingdom, is probably that which took place in Broad Street, Golden Square, and the adjoining streets, a few weeks ago. Within two hundred and fifty yards of the spot where Cambridge Street joins Broad Street, there were upwards of five hundred fatal attacks of cholera in ten days. The mortality in this limited area probably equals any that was ever caused in this country, even by the plague; and it was much more sudden, as the greater number of cases terminated in a few hours. The mortality would undoubtedly have been much greater had it not been for the flight of the population. Persons in furnished lodgings left first, then other lodgers went away, leaving their furniture to be sent for when they could meet with a place to put it in. Many houses were closed altogether, owing to the death of the proprietors; and, in a great number of instances, the tradesmen who remained had sent away their families: so that in less than six days from the commencement of the outbreak, the most afflicted streets were deserted by more than three-quarters of their inhabitants.

There were a few cases of cholera in the neighborhood of Broad Street, Golden Square, in the latter part of August; and the so-called outbreak, which commenced in the night between the 31st August and the 1st September, was, as in all similar instances, only a violent increase of the malady. As soon as I became acquainted with the situation and extent of this irruption of cholera, I suspected some contamination of the water of the much-frequented street-pump in Broad Street, near the end of Cambridge Street; but on examining the water, on the evening of the 3rd September, I found so little impurity in it of an organic nature, that I hesitated to come to a conclusion. Further inquiry, however, showed me that there was no other circumstance or agent common to the circumscribed locality in which this sudden increase of cholera occurred, and not extending beyond it, except the water of the above mentioned pump. I found, moreover, that the water varied, during the next two days, in the amount of organic impurity, visible to the naked eye, on close inspection, in the form of small white, flocculent particles; and I concluded that, at the commencement of the outbreak, it might possibly have been still more impure. I requested permission, therefore, to take a list, at the General Register Office, of the deaths from cholera, registered during the week ending 2nd September, in the subdistricts of Golden Square, Berwick Street, and St. Ann's, Soho, which was kindly granted. Eighty-nine deaths from cholera were registered, during the week, in the

three subdistricts. Of these, only six occurred in the four first days of the week; four occurred on Thursday, the 31st August; and the remaining seventy-nine on Friday and Saturday. I considered, therefore, that the outbreak commenced on the Thursday; and I made inquiry, in detail, respecting the eighty-three deaths registered as having taken place during the last three days of the week.

On proceeding to the spot, I found that nearly all the deaths had taken place within a short distance of the pump. There were only ten deaths in houses situated decidedly nearer to another street pump. In five of these cases the families of the deceased persons informed me that they always sent to the pump in Broad Street, as they preferred the water to that of the pump which was nearer. In three other cases, the deceased were children who went to school near the pump in Broad Street. Two of them were known to drink the water; and the parents of the third think it probable that it did so. The other two deaths, beyond the district which this pump supplies, represent only the amount of mortality from cholera that was occurring before the irruption took place.

With regard to the deaths occurring in the locality belonging to the pump, there were sixty-one instances in which I was informed that the deceased persons used to drink the pump-water from Broad Street, either constantly, or occasionally. In six instances I could get no information, owing to the death or departure of everyone connected with the deceased individuals; and in six cases I was informed that the deceased persons did not drink the pump-water before their illness.

The result of the inquiry then was, that there had been no particular outbreak or increase of cholera, in this part of London, except among the persons who were in the habit of drinking the water of the above-mentioned pump-well.

I had an interview with the Board of Guardians of St. James's parish, on the evening of Thursday, 7th September, and represented the above circumstances to them. In consequence of what I said, the handle of the pump was removed on the following day.

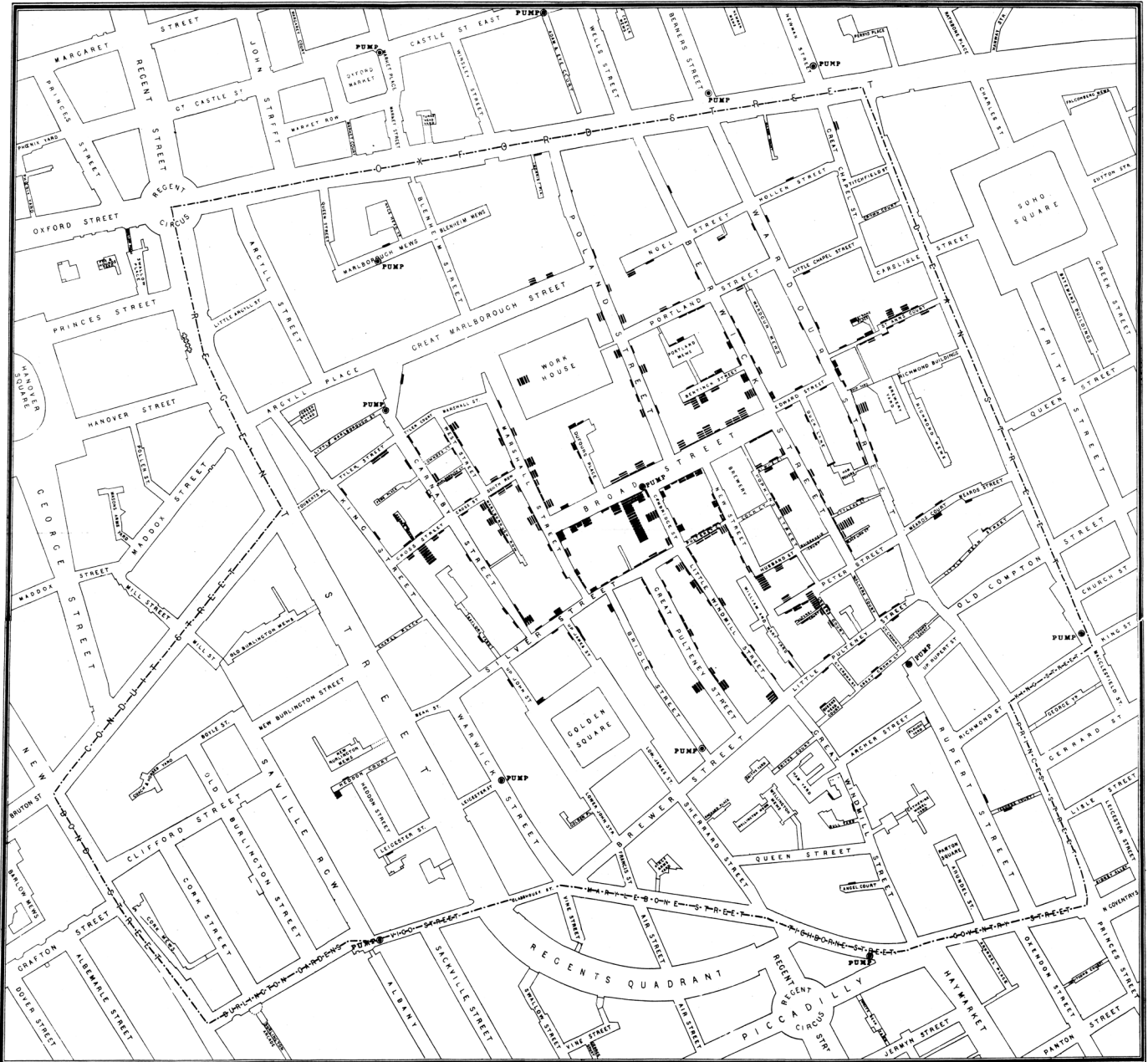
Table 1 Grid Location of Deaths Due to Cholera in 1854 London, Plus Water Pumps and Brewery Locations

Water Pump Locations	Brewery Location	#	Deaths Due to Cholera—Grid Locations									
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
		1	L18	S4	G6	J15	G6	S14	P6	G6	Q15	M8
		2	R14	P13	R11	O11	O11	W14	Q14	O11	W10	R11
T6	X13	3	O15	O9	T14	O14	O14	K15	O16	N16	N6	R11
D7	X14	4	M13	N16	P11	O13	O13	R11	N13	R15	J11	M15
P7	X15	5	O11	L9	R14	T14	T14	Q15	J15	N9	M9	O15
G11	Y13	6	L17	Q16	M16	U17	U17	J16	O17	J19	X19	M17
P14	Y14	7	N16	S13	Q12	T18	T18	P11	M17	N17	U12	S15
Y14	Y15	8	M14	O12	L13	N11	N11	R15	O14	N13	S19	U14
I16		9	R13	S14	O12	N14	N14	M11	P16	N16	R15	S13
Z18		10	N14	Q15	P13	O12	O12	M11	L17	L17	L18	J16
J20		11	O16	O22	O9	T9	T9	G22	T9	T9	M9	L11
D21		12	N12	Q14	Q13	N17	N17	S13	L11	O15	N13	X19
L26		13	N12	N14	N14	M14	M14	Q12	N13	N15	R16	M15
		14	U20	O15	M12	P15	P15	Q15	S12	J15	S12	L17
		15	O14	O8	M17	P8	P8	M8	P6	P9	Q20	U20
		16	Q15	P17	J19	M15	M15	R11	P11	Q15	O13	L18
		17	P8	O18	L17	R16	R16	M13	N14	P15	P12	O22
		18	T9	R16	R14	M13	M13	K15	M16	Q12	R20	L21
		19	O13	T15	O14	K12	K12	P17	K15	R16	O5	O15
		20	O23	Q13	K15	P8	P8	R15	O12	Q16	J15	U20

Table 1 (Continued)

Water Pump Locations	Brewery Location	#	Deaths Due to Cholera—Grid Locations										
			Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	
		21	R15	J12	R15	M17	R14	R13	O12	U14	U14	U14	O16
		22	N17	L13	N16	N12	N13	N17	P9	N9	L17	O16	O16
		23	P11	K20	N14	N14	N14	N12	G19	U20	K14	L11	L11
		24	M14	P11	M14	N17	N17	Q15	N15	N12	P23	K17	K17
		25	P13	U20	M14	J16	J16	W17	K14	K14	L18	R20	R20
		26	L18	O17	L13	L17	L17	M15	N16	N12	M15	S19	S19
		27	M11	Q15	N14	Q15	Q15	N13	R15	M17	L18	O8	O8
		28	N13	N16	Q17	L13	L13	M17	J11	Q15	M8	M11	M11
		29	L13	S19	N8	M13	M13	Q16	L8	P9	F17	M13	M13
		30	R8	U6	Q15	N16	N16	L13	R14	T21	U20		
		31	P14	T21	L18	L9	L9	M8	R11	N11	L18		
		32		M13	R20	O8	O8	P6	T13	L9	T13		
		33		N13	L18	T21	T21	N23	P11	M11			
		34		N13	P6	N9	N9	P13	K9	U20			
		35		N13	S12	N13	N13	M11	N13				
		36		P14	P13	N11	N11	M12	N16				
		37		L9	L9	L11	L11	O13	T21				
		38			O13	O21	O21						
		39				G23	G23						
		40				S14	S14						
		Total	31	36	38	40	37	37	37	34	31	29	29

Exhibit 1 Map Showing the Location of Deaths From Cholera in Soho District of London and Location of Water Pump Sites



Source: Excerpt from *On the Mode of Communication of Cholera* by John Snow, MD. London: John Churchill, New Burlington Street, England, 1855 (pp. 38-55).

Questions for “Instances of the Communication of Cholera Through the Medium of Polluted Water in the Neighborhood of Broad Street, Golden Square” by John Snow

LEVEL 1

General Understanding

- What kind of text is this? Which parts of the text did you use to come up with your answer?
- What illness is being described in this text?

Key Details

- Explain the effect cholera has had on the people in the neighborhood of Broad Street, Golden Square.
- How many fatalities occurred in the 10-day period described?
- Why did the most people die within two days of one another?
- What does the doctor suspect is the cause of this outbreak?

LEVEL 2

Vocabulary

- Examine the vocabulary used in this piece. Who do you think the intended audience is, based on the words used in the text?
- What does *mortality* mean?
- What is the difference between a “case” of cholera and an “outbreak”?
- Why do you think the author says, “The mortality in this limited area probably equals any that was ever caused in this country, even by the plague”? What is the effect of mentioning the plague in this context?

Structure

- How does Dr. Snow prove that the water pump is the cause of the outbreak?
- What does Dr. Snow discover about the water in the pump on September 3rd? How is this significant to his idea that the pump caused the outbreak?
- What facts do not support Dr. Snow’s idea that the pump is the cause of the outbreak? How does he explain these contradictions?

Author’s Craft

- What is so important about the number of deaths and the area where they happened? Why is this information first?
- Did people continue to contract cholera after they left the area near the pump? How does this help support Dr. Snow’s theory?
- How does Dr. Snow describe the water he observes from the pump? What details does he include?

LEVEL 3

Author's Purpose

- What does Dr. Snow want his readers to believe about the cholera outbreak he describes?
- Describe the evidence Dr. Snow uses to prove that the Broad Street water pump is causing the outbreak.
- Do you think the audience of this text is easily convinced that water causes cholera? Why or why not? Use evidence from the text to support your position.

Intertextual Connections

- Examine Table 1. What information did Dr. Snow use to place the deaths from cholera on a grid? How does this support his written report? What extra information would help you understand the statistics in Table 1?
- Compare Exhibit 1 and the information in Paragraph 3. How does the image support the evidence introduced in the actual report?

LEVEL 4

Opinion With Evidence or Argument

- Imagine you were on the Board of Guardians. Would you believe Dr. Snow's theory or not? In a short paragraph, explain why you were or weren't convinced by his argument that the Broad Street pump caused the outbreak.

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