A Contagious City –
120 years of typhoid control and eradication in Oxford

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Aims

1. Show potential of interdisciplinary research to utilize past data on disease and interventions.

2. Challenge heroic tales of Western sanitary control.

3. Highlight historical importance of financial credit and bottom-up coalitions for typhoid control.
Part One – Oxford

Image A busy day on The High, Wikicommons
Context: Hydrology

- Low-lying
- At conjunction of two river systems (Thames and Cherwell)
  - Prone to flooding
  - Poor drainage

Image Source: Bartholomew’s Half-inch map of Engl. & Wales, 1903, S 24 Oxford; BBC 2014; Oxfordhistory.org
Context: From Country to Industrial Town

Rapid growth during 19th and 20th centuries fuelled by:
- Rural Migration
- Industrialisation
- Administrative expansion

Population growth from:
- Ca. 12,000 (1801) to 49,000 (1901) to 98,684 (1951)

- Expanding urban footprint, housing crisis, resource constraints

Image Source: County Ordnance Maps 1898/1899; 1919; 1946
Context: from county to industrial town

- Significant seasonal migration (students).
- High-levels of economic inequality
- Social tensions (town vs. gown)
- Geographically defined destitution (slums).

Image Source: University of Oxford; Levanthal Collections
Part Two – Finding Typhoid in Oxford

Image Source Punch, 1879
Finding Typhoid in Oxford

1837 Registration Act
1837 Gerhard sets out the clinical/pathological difference with typhus
1849 Budd shows cholera water transmissible
1872 Oxford appoints full time MoH
1880 Eberth identifies typhoid bacillus
1889 Notification of Diseases Act
1900 Paratyphoid B isolated

➤ Problem of retrospective diagnosis:

➤ Consistent Oxford reporting only from 1870s onwards/
Typhoid in Oxford 1872-1947

- Typhoid Incidence (combined)
- Para B Incidence
- Para A Incidence
- Typhoid Mortality

Image Source Kirchhelle & Vanderslott (2018)
Incidence by District

Incidence & mortality highest in poorest, overcrowded, and low-lying areas of the city

Source: Kirchhelle & Vanderslott 2018, MoH Report 1936,
Part Three – Contested Reform

Image Source Punch, 1852
A Heroic Age? – non-linear reforms

Water quality and inadequate drainage identified as health problems since 18th century.

However, intervention stalemate due to:

- Fragmented local interests (town vs. gown)
- Disagreement over finance & solutions
- Professional rivalry
- Hostility towards government control

Image Source OHC, 1871 Oxford Plan
The Local Economy of Typhoid

University Clinicians

William Ormerod (1818–1860)
Henry Acland (1815–1900)
William Greenhill (1814–1894)

Engineers/surveyors

Sir William Cubitt (1785–1861)
Thomas Smith (1826–1886)
John Galpin (1824–1891)
Sir Joseph Bazalgette (1819–1891)
John La Trobe Bateman (1810–1889)

Public Health

Gilbert Child (1715–1886)
George Rowell (1804–1892)
Sir George Buchanan (1831–1895)
Central government

City

James Grainge (1827–1879)
Reform in a time of Cholera: 1832, 1849, 1854

William Ormerod 1848
University experts compile data from 1832/1849/1854 cholera outbreaks.

➢ Target non-university areas.

Henry Acland 1856

Image Source Bodleian Libraries
## Town vs. Gown: Finance Deadlock

<table>
<thead>
<tr>
<th>Public health and sanitation</th>
<th>Drainage</th>
<th>Sewage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ormerod</strong> On the Sanitary Condition of Oxford (1848)</td>
<td>Cubbitt &amp; Smith Inquiry into city drainage (1851)</td>
<td>Galpin 1st report on improved sewage system (1854)</td>
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<td><strong>Rowell</strong> The public health of Oxford (1849)</td>
<td>Bazalgette Drainage plan for city (1865)</td>
<td>Galpin 2nd report on drainage (1867)</td>
</tr>
<tr>
<td><strong>Greenhill</strong> Report on the mortality &amp; public health of Oxford (1850)</td>
<td>Bateman Drainage report (1867)</td>
<td>- no action</td>
</tr>
<tr>
<td><strong>Acland</strong> Memoir on the cholera at Oxford, in the year 1854 (1856)</td>
<td>Ewart Drainage report (1867)</td>
<td>- too expensive</td>
</tr>
<tr>
<td><strong>Child</strong> two reports on Oxford sanitation (1866)</td>
<td><strong>Clarke</strong> Drainage report (1869)</td>
<td>- no money for adoption</td>
</tr>
<tr>
<td><strong>Buchanan</strong> report on health and provision (1870-3)</td>
<td>- recommended but overhauled</td>
<td>- not adopted</td>
</tr>
</tbody>
</table>

- turned down because of great expense
- no action
- too expensive
- no money for adoption
- recommended but overhauled
Scandal & Credit

Stagnation of sanitary reform only resolved by:

Prominent Oxford typhoid outbreaks:
- **1874** Typhoid outbreak kills 3 undergraduates
- **1875** Prince Leopold ill with typhoid
- **1879** Mayor dies of typhoid

Damning national reports

The provision of cheap national credit:
- **1848** Public Health Act
- **1871** Local Government Act

- **1870s/1880s**: Wave of reform, end of separate water systems, creation of self-sustaining municipal services.
Scandal & Credit

Figure 3. Capital expenditure at constant prices: sample of 36 towns in England and Wales, 1884–1913 (annual average expenditure per town in £). (Source: Annual local tax returns for England and Wales, 1884–1913, PP 1885–1915.) The nominal expenditures are multiplied by 100 and divided by the Rousseaux price index (average 1865 and 1885 = 100), from B. R. Mitchell, *British Historical Statistics* (Cambridge, 1988).

Image Source Bell & Millward 1998
From Stagnation to Reform

**Drinking Water:**

1825  
<10% houses supplied by piped water intake below sewage outlet/ wells remain popular.

1856  
Switch to spring- and river fed gravel pond.

1883  
Sand-filtration beds at waterworks, pumped filtered water stored in underground tanks.

1885  
New Water intake upstream of city

1886  
All houses connected to pressurized mains (end of separate town/gown supplies.

1930  
New river- and spring fed reservoirs constructed – chlorination introduced

1934  
Switch to upstream supply.

**Sewerage:**

1873–1880  
City sewerage system and sewage farm

1884-1920  
Expansion to new areas.
Which interventions make a difference?

Contemporaries do not conclusively know but still implement reforms!

Joseph Lister to Henry Acland 1891:
“I do not see that the proposed investigation (of typhoid bacteria) with the water is likely to lead to results of practical value.”
Epilogue: 1940-1960 – Towards Eradication
Conclusion: Non-linear multi-pronged reform

The history of typhoid in Oxford reveals a story of evolving hit and miss strategies for typhoid control (no linear correlation knowledge and action).

Importance of cheap credit/debt for:
- creating effective local reform alliances;
- making government interference acceptable to local powers;
- allowing cities to construct, finance, and service water supply systems;
- In the absence of clear knowledge of causation pathways, creating capacity for tailored multi-layered local strategies is key.

Revisiting past interventions is useful: parallels to control challenges in current endemic settings (urbanisation, inequality, fragmented coalitions, lack of resources).

Use typhoid’s history to engage current publics…
Coming to Oxford & Atlanta in 2020

www.typhoidland.org

@typhoidland

Image Source Oxfordshire History Centre
Disease Foci
1840s and 1920s Disease Incidence
Mapping disease today

Source: Kirchhelle & Vanderslott 2019.
Typhoid Mortality 1872-1947

Image Source Kirchhelle & Vanderslott (2018)