Changing household composition and structure in selected local authorities of London and Middlesex during the first decade of the 20th century

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Outline

• Research aim and context
• Data sources and methods
• Preliminary results
• Conclusions

• Research initiated under a Senior Research Fellowship funded by The British Academy/Leverhulme Trust
Research Aim

• **Aim**
  – Explore the practicalities of capturing household and individual level Population Census Data from censuses carried out early in 20\(^{th}\) century and linking these to contemporary 21\(^{st}\) census geographies and statistics

• **Indicative research question**
  – What are the similarities and differences in the small area social geography and demography of London and Middlesex in the early 20\(^{th}\) and 21\(^{st}\) centuries?
  – Are the areas that were relatively deprived then also less well off now?

• **Why London**
  – Capital city
  – Link with Booth Poverty maps for end of 19\(^{th}\) century
Selection of London Boroughs

- Boroughs selected with reference to % population change 1901-11
- Numbers of households/persons

1911 London County Boroughs

Hsd%Chg 1901-11
HsDensChg 1901-11
PerDensChg 1901-11
Pop%Chg 1901-11
Selection of Middlesex Districts

1911 Middlesex County Districts

Percentage population change

Difference in household and population density

-100.00 -50.00 0.00 50.00 100.00 150.00 200.00

Heston and Isleworth UD/MB
Hampton Wick UD
Staines UD
Sunbury on Thames UD
South Mimms RD
Kingsbury UD
Brentford UD
Feltham UD
Hornsey UD/MB
Uxbridge RD
Uxbridge MB/UD
Staines RD
Teddington UD
Chiswick UD
Greenford UD
Enfield MB/UD
Tottenham UD/MB
Yiewsley and West Drayton UD
Willesden UD/MB
Hampton UD
Edmonton UD/MB
Twickenham MB/UD
Wood Green UD/MB
Acton UD/MB
Hendon RD
Hayes UD
Harrow on the Hill UD
Hendon UD/MB
Ruislip Northwood UD
Finchley MB/UD
Hanwell UD
Ealing UD/MB
Southall UD/MB
Wealdstone UD
Southgate MB/UD
Wembley UD/MB

-6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00

Hsd%Chg 1901-11
PerDensChg 1901-11
HsdDensChg 1901-11
Pop%Chg 1901-11

ESSHC Valencia 30/03-02/04 2016
## Selected Boroughs/Districts

<table>
<thead>
<tr>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>City of London MB</td>
<td>5339</td>
<td>3995</td>
<td>26923</td>
<td>19657</td>
<td>-25.17</td>
<td>-1.99</td>
<td>-10.76</td>
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<tr>
<td>Deptford MB</td>
<td>24,615</td>
<td>25040</td>
<td>110398</td>
<td>109496</td>
<td>1.73</td>
<td>0.27</td>
<td>-0.58</td>
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<tr>
<td>Hammersmith MB</td>
<td>25,810</td>
<td>28462</td>
<td>112239</td>
<td>121521</td>
<td>10.28</td>
<td>1.16</td>
<td>4.06</td>
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<tr>
<td>London County</td>
<td>1,019,048</td>
<td>1,033,861</td>
<td>4,536,267</td>
<td>4,521,685</td>
<td>0.54</td>
<td>-0.71</td>
<td>-3.99</td>
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<tr>
<td>Hampton Wick UB</td>
<td>567</td>
<td>551</td>
<td>2606</td>
<td>2417</td>
<td>-2.82</td>
<td>-0.01</td>
<td>-0.14</td>
</tr>
<tr>
<td>Hayes UD</td>
<td>587</td>
<td>887</td>
<td>2594</td>
<td>4261</td>
<td>51.11</td>
<td>0.61</td>
<td>0.50</td>
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<tr>
<td>Wembley UD/MB</td>
<td>905</td>
<td>2434</td>
<td>4519</td>
<td>10696</td>
<td>168.95</td>
<td>0.34</td>
<td>1.35</td>
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<tr>
<td>Middlesex</td>
<td>166,007</td>
<td>249,334</td>
<td>782,066</td>
<td>1,087,465</td>
<td>55.13</td>
<td>0.83</td>
<td>3.30</td>
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</table>
Borough of Hammersmith

- Former London and Middlesex counties together smaller than contemporary Greater London Authority
- Paper focuses on 1911 Census data for Hammersmith Borough in the former London County
Data Sources

• **20\textsuperscript{th} century**
  – 1911, 1901 and potentially earlier Population Census records
  – Ordnance Survey Historical topographic mapping (scanned images)

• **21\textsuperscript{st} century**
  – Ordnance Survey Master Map (MM2) topographic map layers
  – Ordnance Survey Master Map Address Layer (MMAL)
1911 Census Schedule

- Example of census schedule illustrating damage curated by The National Archives
### 1911 Census Transcript

- Attribute data limited to name, relationship in household, sex, age, birth year, occupation and birthplace; address, enumeration district and number of rooms

<table>
<thead>
<tr>
<th>Schedule number</th>
<th>House number, road/street name, name</th>
<th>Number of rooms if less than 5</th>
<th>Name and surname</th>
<th>Relationship to head of family</th>
<th>Condition as to marriage</th>
<th>Sex</th>
<th>Age last birthday</th>
<th>Profession or occupation</th>
<th>Birthplace</th>
<th>rt: (1) deaf and dumb, (2) blind, (3) lunatic, (4) imbecile, feeble-minded</th>
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</thead>
<tbody>
<tr>
<td>61</td>
<td>Ivy Cottage, Park Road</td>
<td></td>
<td>John Martin</td>
<td>Head</td>
<td>Married</td>
<td>Male</td>
<td>29</td>
<td>Aras Tapestry weaver</td>
<td>Middx: Hampton Wick</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Louisa Martin</td>
<td>Wife</td>
<td>Married</td>
<td>Female</td>
<td>26</td>
<td></td>
<td>London: Stepney</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>William Martin</td>
<td>Son</td>
<td></td>
<td>Male</td>
<td>3</td>
<td></td>
<td>Middx: Hampton Wick</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Schedule number</th>
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<th>Profession or occupation</th>
<th>Birthplace</th>
<th>rt: (1) deaf and dumb, (2) blind, (3) lunatic, (4) imbecile, feeble-minded</th>
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</thead>
<tbody>
<tr>
<td>176</td>
<td>Ivy Cottage, Park Road</td>
<td>5</td>
<td>John Martin</td>
<td>Head</td>
<td>Married</td>
<td>Male</td>
<td>39</td>
<td>Aras Tapestry weaver</td>
<td>Middx: Hampton Wick</td>
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<tr>
<td></td>
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<td></td>
<td>Louisa Martin</td>
<td>Wife</td>
<td>Married</td>
<td>Female</td>
<td>36</td>
<td></td>
<td>London: Stepney</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>William Martin</td>
<td>Son</td>
<td></td>
<td>Male</td>
<td>13</td>
<td></td>
<td>Middx: Hampton Wick</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Doris Martin</td>
<td>Daughter</td>
<td></td>
<td>Male</td>
<td>4</td>
<td></td>
<td>Middx: Hampton Wick</td>
<td></td>
</tr>
</tbody>
</table>
Historical Topographicc Maps

- County Series, 1:2,500, First Edition, 1895, Kent
- Example of residential development in Deptford
Historical and Modern OS Maps

- Historical topographic maps scanned and georeferenced by Landmark
- MM2 buildings and address points on land not developed in 1901 and 1911
- Former houses demolished and redeveloped as larger buildings
- Many building footprints almost identical
Matching/Geocoding

- Match addresses from transcribed 1901 and 1911 Census records and MMAL2 data; geocode joined spatial and attribute data; and create point features for addresses.
- Examine visualisation of geocoded census addresses alongside MMAL2 addresses; and identify and correct anomalies (e.g. through road name changes).
- Identify non-geocoded addresses from stages 1 and 2 and locate on historic map images; and manually digitise new points and transfer addresses from 1901 and 1911 Census data to additional points.
- Create a unified file of matched spatial and census data for each set of households and individuals in 1901 and 1911.
Examples

- 5,944 (26%) of 1911 census addresses digitised on screen
- Jeddo Road (correct on map and in MM2) incorrectly transcribed as Jedds Road (error in census data > non-match)
- Rayleigh Road became Rayleigh Grove (road name changed > non-match)
- Identify non-geocoded addresses, find them on historic map images and manually digitise new points
- Majority of 1901 addresses also present in 1911
Address Points
Hammersmith

• Majority of 1901 addresses also present in 1911
Preliminary Results

• Some initial tabulated results on household size, age structure, place of birth and length of marriage for presented at previous conferences.

• Following slides illustrate some of the micro-scale analyses possible with georeferenced household and individual records.
Measurement of population density along streets

Persons per metre on streets in Hammersmith 1911

- 3.01 - 5.99
- 1.51 - 3.00
- 0.51 - 1.50
- 0.02 - 0.50
Variation in number of separate households per address

Households per 1911 address
Change in number of persons at addresses 1901 to 1911

Difference in persons per address 1901 to 1911
Balance of males and females at addresses in 1911

Males and females per 1911 address
Age structure of persons at addresses in 1911

Age structure of persons at 1911 addresses
Married, single and widowed persons at 1911 addresses
Conclusions and Future Work

• Data record linkage feasible, but complexities remain
• Expected and unexpected difficulties of dealing with historic records
• Linkage between historic and modern datasets offers exciting new analytical possibilities
• Analysis of other social and demographic variables
• Potential for linkage with Booth poverty maps in London County Boroughs
Acknowledgments


• Office for National Statistics, 2001 Census: Aggregate data (England and Wales) [computer file]. UK Data Service Census Support. Downloaded from: http://infuse.mimas.ac.uk. This data is licensed under the terms of the Open Government Licence [http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2].

• This work is based on data provided through EDINA UKBORDERS with the support of the ESRC and JISC and uses boundary material which is copyright of the Crown. It also uses data provided under licence by the Ordnance Survey.