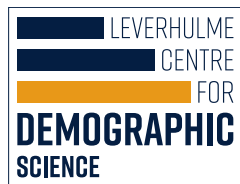


Health By Wealth: Computational tools and population level data uncover substantial inequalities in health over the very long run

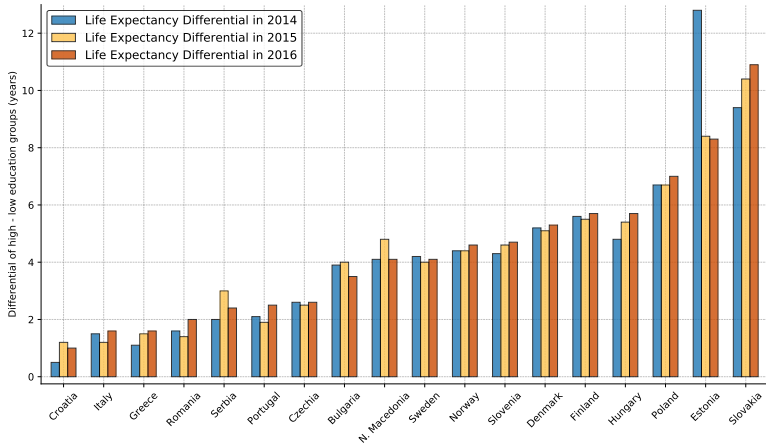
Naomi Muggleton, Aaron Reeves, **Charles Rahal**, Alexandra Rottenkolber, Linda Li

Leverhulme Centre for Demographic Science

European Population Conference, June 5th, 2026

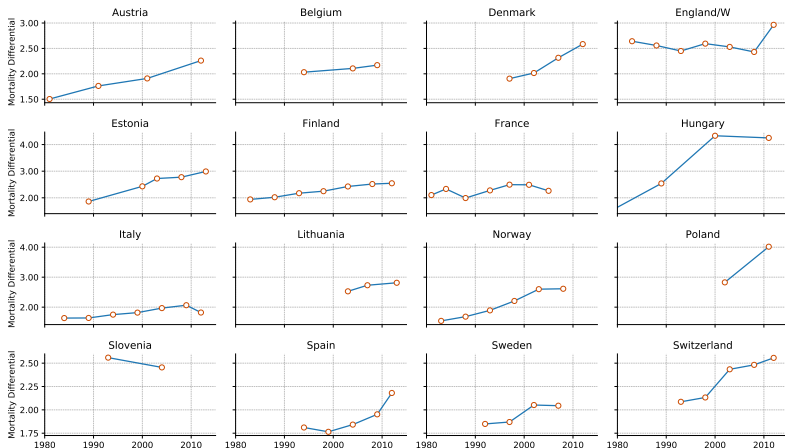


Health inequalities are pervasive



Source: Eurostat. Note: Not a selective subset – this is for **all** countries measured. Differential measured as life expectancy for those with 'Tertiary' education minus life expectancy of those with 'Less than primary, primary or lower secondary' education.

Health inequalities are persistent

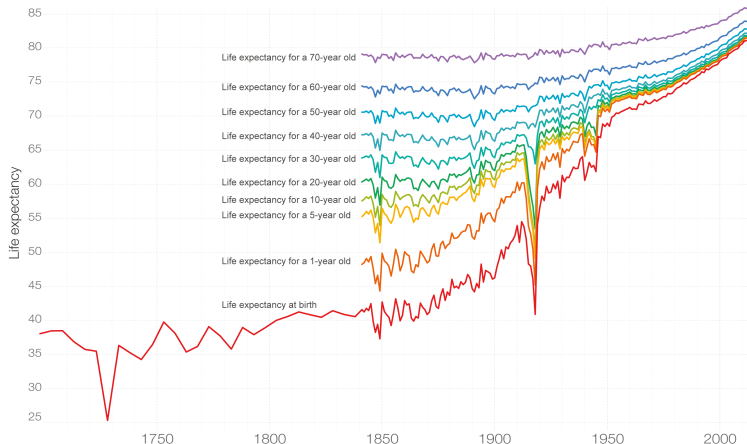


Source: Data from Mackenbach, J.P. et al. (2018). Trends in health inequalities in 27 European countries. *PNAS*, 15(25), 6440-6445. Specifically: their 'Relative Index of Inequality', harmonised across countries to International Standard Classification of Education 1997 categories. *y*-axis again relates to high-to-low education.

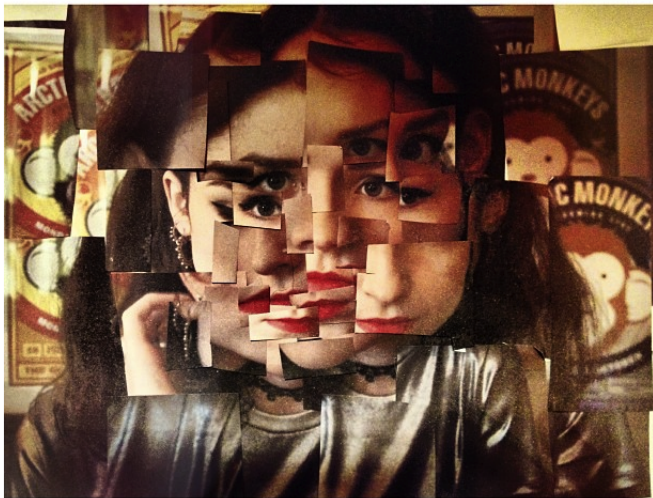
Long-run individual mortality evidence is rare

Life Expectancy by Age in England and Wales, 1700-2013

Shown is the total life expectancy given that a person reached a certain age.



Until recently, historical evidence had arrived as snapshots



Historical evidence arrives as snapshots

Liverpool, 1840

- Chadwick studied Liverpool deaths.
- Professionals: average age 35.
- Tradesmen: average age 22.
- Labourers: average age 15.
- Mortality tracked class position.

Whitehall studies

- Civil servants followed prospectively.
- Lower rank, shorter lives.
- Mortality rose down hierarchy.
- Gradient persisted after retirement.
- Risk factors explained part.

These are powerful comparisons, but not linked individual histories.

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Probate records are an underused resource

"Although imperfect in several respects the probate valuations offer comprehensive and objective information on the personal wealth of the entire British population in the modern period. They are, moreover, probably unique among advanced industrial nations in presenting probate valuations for the whole population. . . It is a mystery why so little use has been made of them"

Rubinstein, William D. "Wealth, Elites and the Class Structure of Modern Britain." *Past & Present* 76, no. 1 (1977): 99–126.

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Probate Records (1858-1995)

All wills and administrations



Deceased
person's wishes
for distributing
their assets.

Wills



Legal process
for distributing
assets when
there is no will.

Administrations

Death Registry (1861-1991)

All 66m deaths



John
Doe

Name



Parish



Date



Age

Family Trees

WikiTree database

**Gender Estimation**

Ann
Brian
Camilla
David



Probate Records (1858-1995)

All wills and administrations

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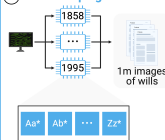
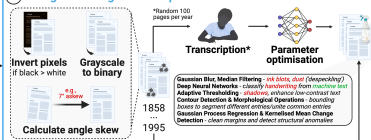
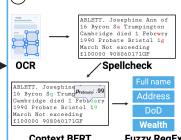
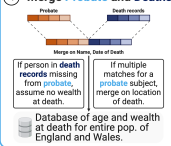
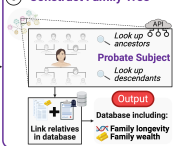
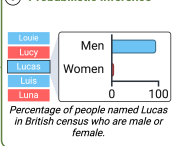
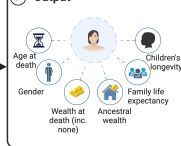
Parish

Date

Age

Family Trees

WikiTree database

**Gender Estimation****1 Web Scraping****2 Image Cleaning with Computer Vision****3 Text Extraction and OCR****4 Merge Probate and Deaths****5 Construct Family Tree****6 Probabilistic Inference****7 Output**

Probate Records (1858-1995)

All wills and administrations

Deceased person's wishes for distributing their assets.

Legal process for distributing assets when there is no will.

Wills

Administrations

Death Registry (1861-1991)

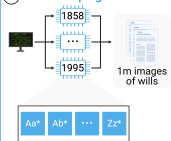
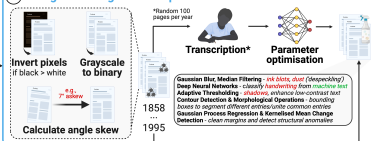
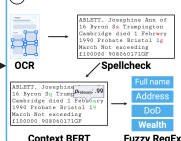
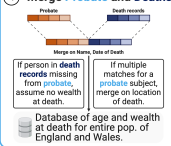
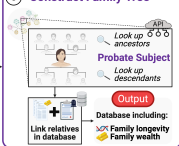
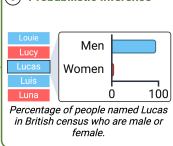
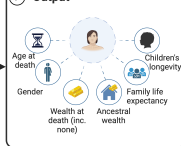
All 66m deaths

John Doe

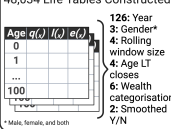
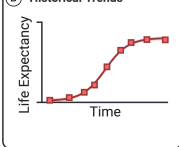
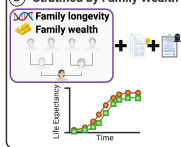
Name Parish Date Age

Family Trees

WikiTree database

**Gender Estimation****1 Web Scraping****2 Image Cleaning with Computer Vision****3 Text Extraction and OCR****4 Merge Probate and Deaths****5 Construct Family Tree****6 Probabilistic Inference****7 Output****(A) Life Tables**

48,034 Life Tables Constructed

**(B) Historical Trends****(C) Stratified by Wealth****(D) Stratified by Family Wealth**

Probate records measure estates at death

- The **Probate Registry Calendar** is a digitised collection of all the wills proved in the UK between 1858 and 1995.
- With very few exceptions (e.g., members of the royal family), **all individuals** who have left behind inheritance are listed in probate records.
 - **Wills:** individuals who have formally expressed a wish for their estate (big or small).
 - **Administration:** where a will was not created, but the estate was valued at (in today's money) $\approx$ £5,000.

Raw probate extract, 1858–1992: 17,077,740 person records.

Probate thresholds changed over time

Years	Nominal probate threshold	Source
1858–1900	£10	Turner (2010, p. 628)
1901–1931	£50	Turner (2010, p. 628)
1932–1964	£100	Atkinson and Harrison (1978, p. 36)
1965–1974	£500	Atkinson and Harrison (1978, p. 36)
1975–1984	£1,500	Atkinson and Harrison (1978, p. 36)
1984–	£5,000	Turner (2010, p. 628); Alvaredo, Atkinson, and Morelli (2018, p. 29); Atkinson, Atkinson, and Morelli (2017, p. F8); Karagiannaki (2015, p. 187)

Source: Cummins, Neil. 2021. "Where Is the Middle Class? Evidence from 60 Million English Death and Probate Records, 1892–1992." *The Journal of Economic History* 81(2): 359–404, Table 1. DOI: 10.1017/S0022050721000164.



DICKENS { Charles otherwise
Charles John
Huffham Esq.

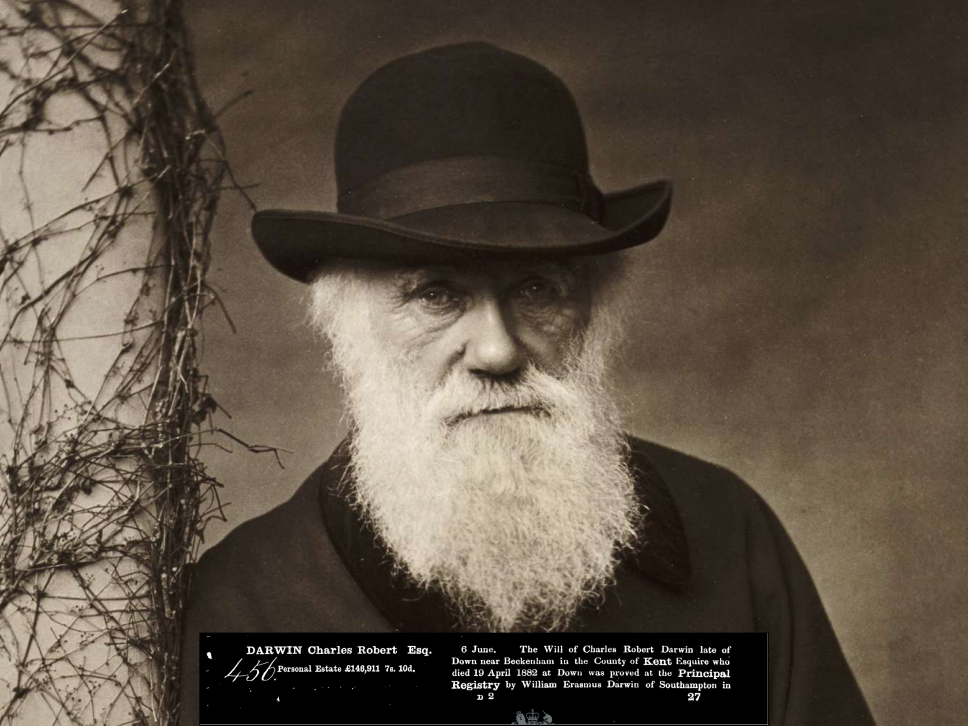
468

Effects under £80,000.

19 July.

The Will

with a Codicil of Charles otherwise Charles John Huffham Dickens late of Gads Hill Place near Rochester in the County of Kent Esquire deceased who died 9 June 1870 at Gads Hill Place aforesaid was proved at the Principal Registry by the oaths of Georgina Hogarth of Gads Hill Place aforesaid Spinster and John Forster of Palace Gate House Kensington in the County of Middlesex Esquire the Executors.



DARWIN Charles Robert Esq.

450

Personal Estate £146,911 7s. 10d.

6 June. The Will of Charles Robert Darwin late of Down near Beckenham in the County of Kent Esquire who died 19 April 1882 at Down was proved at the Principal Registry by William Erasmus Darwin of Southampton in

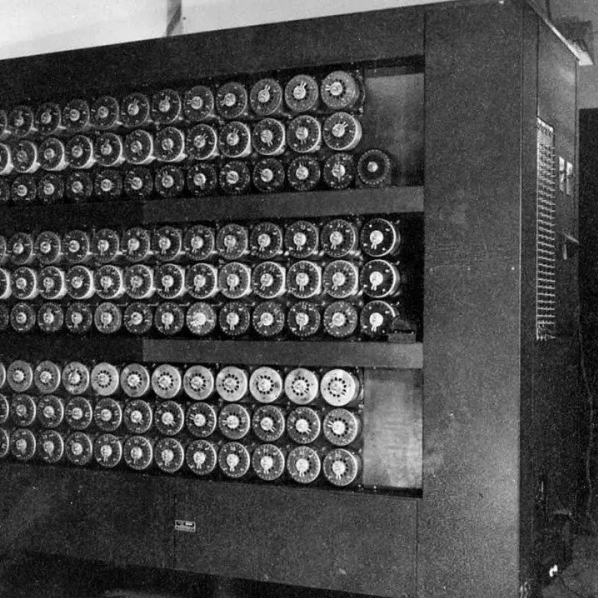
D 2

27





WOOLF Adeline Virginia of Monks House Rodmell near **Lewes**
(wife of Leonard Sidney Woolf) died 28 March 1941 Probate
Llandudno 19 August to the said Leonard Sidney Woolf
publisher. Effects £16868 7s. 7d.
Resworn £14051 3s. 5d.



TURING Alan Mathison of Hollymeade Adlington-road Wilmslow
Cheshire died 8 June 1954 Probate **Manchester** 20 September
to Philip Nicholas Furbank librarian. Effects £4603 5s. 4d.



CHURCHILL the right honourable sir **Winston Leonard Spencer K.G. O.M. C.H.** of Chartwell Manor Westerham Kent and 28 Hyde Park Gate London S.W.7 died 24 January 1965 at 28 Hyde Park Gate Probate London 9 February to dame Clementine Ogilvy Spencer Churchill G.B.E.; widow Mary Soames married woman and John Rupert Colville C.B. C.V.O. banker. E304044.

Probate also captures modest estates

- **John Croxton**; a labourer who died in December 1854 and left £5 (£600 today) to a farmer.
- **Lionel Abbot**; a commercial clerk who died in 1924 and left £65 (£4,000 today) to his son.
- **Susannah Chilvers**; a widow who died in 1964 and left £211 (£4,000 today) to her bricklayer son and homemaker daughter.

Collecting probate meant scraping at national scale

Stage	Step
1.	Set up 138 virtual machines (EC2, AWS) - one for each year.
2.	Sent requests ¹ at a rate of – on average – one request every 10 seconds (plus or minus noise). ²
3.	Use wildcard search to rattle through all surnames between Aa* and Zz*.
4.	Save image in AWS S3 bucket for processing.

Result: 1 million pages of probate records (or, stacked horizontally...)

¹With friendly user agent message providing contact details.

²This is well within normal traffic for server and abides by robots.txt guidelines.

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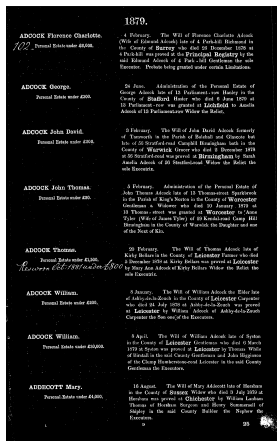
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Computer vision turns scans into usable records



1. Invert colours if black pixels > white pixels
2. From greyscale to binary (black-white)
3. Calculate angle of pixels and deskew
4. Blob removal (e.g., ink blots)
5. Margin detection using Gaussian Process Regression
6. Remove handwriting; keep typewriting
7. Speckle removal (e.g., dust)
8. Bounding boxes around each entry
9. Resize page based on optimal extraction^a

^aHuge thanks to RAs who created training set per year!

Computer vision turns scans into usable records

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ADCOCK Florence Charlotte. Personal Estate under £2500.	4 February. The Will of Florence Charlotte ADCOCK (Wife of Leonard ADCOCK) late of 4 Parkhill Rowland in the County of Surrey who died 25 December 1878 at 4 Parkhill was proved at the Principal Registry by the said Leonard ADCOCK of 4 Parkhill Godstone the sole Executor. Probate being granted under certain Limitations.
ADCOCK George. Personal Estate under £250.	26 June. Administration of the Personal Estate of George ADCOCK late of 12 Palladium Court Haverly in the County of Stafford Haverly who died 6 June 1878 at 12 Palladium Court was granted at Lichfield to Annita ADCOCK of 12 Palladium Court Widow the Sole.
ADCOCK John David. Personal Estate under £250.	9 February. The Will of John David ADCOCK formerly of Tynemouth in the Parish of Belfield and Gosport late of 26 Stratford Road Camploll Birmingham late in the County of Warwick Grever who died 8 December 1878 at 26 Stratford Road was proved at Birmingham by Sarah Annita ADCOCK of 20 Stratford Road Widow the Sole the sole Executrix.
ADCOCK John Thomas. Personal Estate under £25.	5 February. Administration of the Personal Estate of John Thomas ADCOCK late of 15 Thomas Street Spitalfields in the Parish of King's Square in the County of Worcester Goddard a Widower who died 30 January 1873 at 15 Thomas Street was granted at Worcester to Anna Tyler (Wife of James Tyler) of 10 Knollwood Camp Hill Birmingham in the County of Warwick the Daughter and one of the Next of Kin.
ADCOCK Thomas. Personal Estate under £250. <i>Received 666-1887 under £2500</i>	28 February. The Will of Thomas ADCOCK late of Kirby Bellars in the County of Leicestershire Farmer who died 2 December 1874 at Kirby Bellars was proved at Leicester by Henry Ann ADCOCK of Kirby Bellars Widow the Sole the sole Executrix.
ADCOCK William. Personal Estate under £250.	5 January. The Will of William ADCOCK the Elder late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1873 at Ashby-de-la-Zouch was proved at Leicester by William ADCOCK of Ashby-de-la-Zouch Carpenter the Son one of the Executors.
ADCOCK William. Personal Estate under £25000.	5 April. The Will of William ADCOCK late of Syston in the County of Leicestershire Gentleman who died 9 March 1873 at Syston was proved at Leicester by Thomas White of Stratford in the said County Gentleman and John Hargreaves of the Chapp Hawthornwood Leicester in the said County Gentleman the Executors.
AIDSCOTT Mary. Personal Estate under £1200.	16 August. The Will of Mary AIDSCOTT late of Borden in the County of Surrey Widow who died 2 July 1870 at Borden was proved at Chichester by William Ludlow Thomas of Bordon Beggar and Henry Stannard of Stigley in the said County Beggar the Executor the Executors.

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Computer vision turns scans into usable records

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ADCOCK Florence Charlotte. Personal Estate under £6,000.	4 February. The Will of Florence Charlotte ADCOCK (Wife of Edward ADCOCK) late of 4 Parkhill Boulevard in the County of Surrey who died 21 December 1920 at 4 Parkhill was proved at the Principal Registry by the said Edward ADCOCK of 4 Parkhill and Gustave the sole Executor. Probate being granted under certain Limitations.
ADCOCK George. Personal Estate under £100.	21 June. Administration of the Personal Estate of George ADCOCK late of 11 Parliament-street Haverly in the County of Staffordshire who died 4 June 1920 at 11 Parliament-street was granted at Lichfield to Amelia ADCOCK of 23 Parkmans-lane Widow the Relict the sole Executrix.
ADCOCK John David. Personal Estate under £100.	3 February. The Will of John David ADCOCK formerly of Teworth in the Parish of Rotherham and Gloucester but late of 20 Stratford-road Chesham Bovingdon both in the County of Warwickshire who died 2 December 1920 at 20 Stratford-road was proved at Birmingham by Sarah Amelia ADCOCK of 69 Stratford-road Widow the Relict the sole Executrix.
ADCOCK John Thomas. Personal Estate under £25.	5 February. Administration of the Personal Estate of John Thomas ADCOCK late of 13 Thame-street Spetchley in the Parish of King's Norton in the County of Worcester Gloucestershire a Widower who died 12 January 1920 at 13 Thame-street was granted at Worcester to Anne Taylor (Wife of James Taylor) of 22 Radford-road Camp Hill Birmmington in the County of Warwick the Daughter and one of the Next of Kin.
ADCOCK Thomas. Personal Estate under £1,000. <i>Residuary £60,120/10/- under £100</i>	10 February. The Will of Thomas ADCOCK late of Kirby Bellus in the County of Leicestershire Farmer who died 8 December 1920 at Kirby Bellus was proved at Leicester by Mary Ann ADCOCK of Kirby Bellus Widow the Relict the sole Executrix.
ADCOCK William. Personal Estate under £100.	4 January. The Will of William ADCOCK the Elder late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1920 at Ashby-de-la-Zouch was proved at Leicester by William ADCOCK of Ashby-de-la-Zouch Carpenter the Son and of the Executors.
ADCOCK William. Personal Estate under £10,000.	8 April. The Will of William ADCOCK late of Syden in the County of Leicestershire Gentleman who died 12 March 1920 at Syden was proved at Leicester by Thomas White of Brims in the said County Gentleman and John Hughes of the Chapp Hamlet Leicestershire in the said County Gentleman the Executors.
ADBOOTT Mary. Personal Estate under £1,000.	10 August. The Will of Mary ADBOOTT late of Haslem in the County of Herefordshire Widow who died 2 July 1920 at Haslem was proved at Gloucester by William Ludlow Thomas of Haslem Hereford and Henry Samuelson of Stipley in the said County Hereford the Relict the Executors.

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ADCOCK John David. Personal Estate under £100.	3 February. The Will of John David ADCOCK formerly of Tenworth in the Parish of Rotherham and Gloucester last late of 20 Stratford-road Chesham Bovingdon both in the County of Warwickshire who died 2 December 1920 at 20 Stratford-road was proved at Birmingham by Sarah Amelia ADCOCK of 20 Stratford-road Widow the Relict the sole Executrix.
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ADCOCK Thomas. Personal Estate under £1,000. <i>Residuary Estate under £1,000</i>	30 February. The Will of Thomas ADCOCK late of Kirby Bellus in the County of Leicestershire Farmer who died 8 December 1920 at Kirby Bellus was proved at Leicester by Mary Ann ADCOCK of Kirby Bellus Widow the Relict the sole Executrix.
ADCOCK William. Personal Estate under £100.	4 January. The Will of William ADCOCK the Elder late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1920 at Ashby-de-la-Zouch was proved at Leicester by William ADCOCK of Ashby-de-la-Zouch Carpenter the Son and one of the Executors.
ADCOCK William. Personal Estate under £10,000.	8 April. The Will of William ADCOCK late of Syden in the County of Leicestershire Gentleman who died 12 March 1920 at Syden was proved at Leicester by Thomas White of Bressall in the said County Gentleman and John Hughes of the Claydon Hamlet Leicestershire in the said County Gentleman the Executors.
ADBOOTT Mary. Personal Estate under £1,000.	10 August. The Will of Mary ADBOOTT late of Haxham in the County of Bedfordshire Widow who died 2 July 1920 at Haxham was proved at Hitchin by William Ludlow Thomas of Haxham Esquire and Henry Mansfield of Shipley in the said County Builders the Relict the Executors.

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ADCOCK George. Personal Estate under £100.	21 June. Administration of the Personal Estate of George ADCOCK late of 11 Parliament-street Haverly in the County of Staffordshire who died 4 June 1920 at 11 Parliament-street was granted at Litchfield in the County of Staffordshire to the said George ADCOCK the Executor.
ADCOCK John David. Personal Estate under £100.	3 February. The Will of John David ADCOCK formerly of Tewkesbury in the Parish of Batsford and Gloucestershire late of 20 Stratford-road Chesham Bovingdon both in the County of Warwickshire who died 2 December 1933 at 20 Stratford-road was proved at Birmingham by Sarah Ann ADCOCK of 68 Stratford-road the said John ADCOCK's daughter.
ADCOCK John Thomas. Personal Estate under £25.	5 February. Administration of the Personal Estate of John Thomas ADCOCK late of 13 Thame-street Spetchley in the Parish of King's Norton in the County of Worcester Gloucestershire a Widower who died 12 January 1930 at 13 Thame-street was proved at Worcester by Anne Taylor (Wife of James Taylor) of 22 Radford-road Camp Hill Birmmington in the County of Warwick the daughter and one of the next of kin.
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ADCOCK William. Personal Estate under £100.	4 January. The Will of William ADCOCK the Elder late of Ashby-de-la-Zouch in the County of Leicestershire who died 24 July 1933 at Ashby-de-la-Zouch was proved at Leicester by William ADCOCK of Ashby-de-la-Zouch Carpenter the son and one of the Executors.
ADCOCK William. Personal Estate under £10,000.	8 April. The Will of William ADCOCK late of Sydenham in the County of Leicestershire who died 12 March 1933 at Sydenham was proved at Leicester by Thomas White of Bressingham in the said County Gloucestershire and John Hughes of the Chingham Hamlet Leicestershire in the said County Gloucestershire the Executors.
ADBOOTT Mary. Personal Estate under £1,000.	10 August. The Will of Mary ADBOOTT late of Haverly in the County of Staffordshire who died 2 July 1919 at Haverly was proved at Litchfield by William Ludlow Thomas of Haverly Regent and Henry Mansfield of Stalybridge in the said County Hallifax the Executors.

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^aHuge thanks to RAs who created training set per year!

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	1879.
ADCOCK Florence Charlotte. <i>102 Personal Estate under £6,000.</i>	4 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Boulevard in the County of Surrey who died 20 December 1920 at 4 Parkhill was proved at the Principal Registry by the said Edward Adcock of 4 Parkhill Great Queen the sole Executor. Probate being granted under certain Limitations.
ADCOCK George. <i>Personal Estate under £100.</i>	21 June. Administration of the Personal Estate of George Adcock late of 11 Parliament-street Haxley in the County of Staffordshire who died 4 June 1920 at 11 Parliament-street was granted at Litchfield in the County of Staffordshire Widow the Heir.
ADCOCK John David. <i>Personal Estate under £100.</i>	3 February. The Will of John David Adcock formerly of Tamworth in the Parish of Balsall and Glanville late late of 20 Stratford-road Churchill Birmingham both in the County of Warwickshire who died 2 December 1920 at 20 Stratford-road was proved at Birmingham by Sarah Ann Adcock of 68 Stratford-road Widow the Heir the sole Executrix.
ADCOCK John Thomas. <i>Personal Estate under £25.</i>	5 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Thamestreet Spitalfields in the Parish of King's Norton in the County of Worcester Gloucestershire a Widower who died 10 January 1920 at 13 Thamestreet was proved at Worcester by Anne Taylor (Wife of Anne Taylor) of 22 Radford-road Camp Hill Birmingham in the County of Warwick the Daughter and one of the Sons of the late.
ADCOCK Thomas. <i>Personal Estate under £1,000. <i>Residence 66-1287-1288-1289</i></i>	30 February. The Will of Thomas Adcock late of Kirby Bellon in the County of Leicestershire Farmer who died 2 December 1920 at Kirby Bellon was proved at Leicester by Mary Ann Adcock of Kirby Bellon Widow the Heir the sole Executrix.
ADCOCK William. <i>Personal Estate under £100.</i>	4 January. The Will of William Adcock the Elder late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1920 at Ashby-de-la-Zouch was proved at Leicester by William Adcock of Ashby-de-la-Zouch Carpenter the Son and one of the Executors.
ADCOCK William. <i>Personal Estate under £10,000.</i>	8 April. The Will of William Adcock late of Syden in the County of Leicestershire Gentleman who died 12 March 1920 at Syden was proved at Leicester by Thomas White of Syden in the said County Gentleman and John Hughes of the Claydon Hamlet Leicestershire in the said County Gentleman the Executors.
ADBOOTT Mary. <i>Personal Estate under £1,000.</i>	10 August. The Will of Mary Adboott late of Haxham in the County of Bedfordshire who died 2 July 1920 at Haxham was proved at Leicester by William Ludlow Thomas of Haxham Esquire and Henry Mansel of Stalybridge in the said County Builders the Executors.

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1879.

ADCOCK Florence Charlotte.
Personal Estate under £6,000.

4 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Mansions in the County of Surrey who died 21 December 1933 at 4 Parkhill was proved at the Principal Registry by the said Edward Adcock of 4 Park Hill Gardens the sole Executor. Probate being granted under certain Limitations.

ADCOCK George.
Personal Estate under £100.

21 June. Administration of the Personal Estate of George Adcock late of 11 Parliament-street Haxley in the County of Staffordshire who died 4 June 1929 at 11 Parliament-street was granted at Litchfield to Anna Adcock of 23 Parkmansmore Widow the Heiress.

ADCOCK John David.
Personal Estate under £100.

3 February. The Will of John David Adcock formerly of Tamworth in the Parish of Balsall and Glanville last late of 20 Stratford-road Churchill Birmingham last in the County of Warwickshire who died 2 December 1933 at 20 Stratford-road was proved at Birmingham by Sarah Anna Adcock of 69 Stratford-road Widow the Heiress the sole Executrix.

ADCOCK John Thomas.
Personal Estate under £25.

5 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Thorneycroft Spitalfields in the Parish of King's Norton in the County of Worcester Gloucester a Widower who died 10 January 1930 at 13 Thorneycroft-street was proved at Worcester to Anne Taylor (Wife of James Taylor) of 22 Radford-road Camp Hill Birmingham in the County of Warwick the Daughter and one of the Next of Kin.

ADCOCK Thomas.
Personal Estate under £1,000.

30 February. The Will of Thomas Adcock late of Kirby Bellas in the County of Leicestershire Farmer who died 5 December 1933 at Kirby Bellas was proved at Leicester by Mary Ann Adcock of Kirby Bellas Widow the Heiress the sole Executrix.

ADCOCK William.
Personal Estate under £100.

4 January. The Will of William Adcock late of Esher late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1933 at Ashby-de-la-Zouch was proved at Leicester by William Adcock of Ashby-de-la-Zouch Carpenter the Son and one of the Executors.

ADCOCK William.
Personal Estate under £10,000.

8 April. The Will of William Adcock late of Sydenham in the County of Leicestershire Gentleman who died 12 March 1929 at Sydenham was proved at Leicester by Thomas White of Bressingham in the said County Gentleman and John Hughes of the Clung Hamlet Leicestershire in the said County Gentleman the Executors.

ADDSOOT Mary.
Personal Estate under £1,000.

10 August. The Will of Mary Addsoot late of Haslemere in the County of Surrey Widow who died 2 July 1933 at Haslemere was proved at Chichester by William Ludlow Thomas of Haslemere Esquire and Henry Mansel-Pleydell of Sturley in the said County Barrister the Heiress the Executors.

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1879.

ADCOCK Florence Charlotte.
Personal Estate under £6,000.

4 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Mansions in the County of Surrey who died 21 December 1928 at 4 Parkhill was proved at the Principal Registry by the said Edward Adcock of 4 Park Hill Gardens the sole Executor. Probate being granted under certain Limitations.

ADCOCK George.
Personal Estate under £100.

21 June. Administration of the Personal Estate of George Adcock late of 11 Parliament-street Haxley in the County of Stafford Haxley who died 4 June 1929 at 11 Parliament-street was granted at Lichfield to Anna Adcock of 23 Parkmansmore Widow the Heiress.

ADCOCK John David.
Personal Estate under £100.

9 February. The Will of John David Adcock formerly of Tamworth in the Parish of Balsall and Glanville last late of 20 Stratford-road Churchill Birmingham last in the County of Warwick Glanville who died 2 December 1923 at 20 Stratford-road was proved at Birmingham by Sarah Anna Adcock of 69 Stratford-road Widow the Heiress the sole Executrix.

ADCOCK John Thomas.
Personal Estate under £25.

5 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Thomsenstreet Spetchworth in the Parish of King's Norton in the County of Worcester Grafton a Widower who died 12 January 1929 at 13 Thomsen-street was granted at Worcester to Anne Taylor (Wife of James Taylor) of 22 Keddleford Camp Hill Birmingham in the County of Warwick the Daughter and one of the Next of Kin.

ADCOCK Thomas.
Personal Estate under £1,000.

30 February. The Will of Thomas Adcock late of Kirby Bellon in the County of Leicestershire Farmer who died 5 December 1924 at Kirby Bellon was proved at Leicester by Mary Ann Adcock of Kirby Bellon Widow the Heiress the sole Executrix.

ADCOCK William.
Personal Estate under £100.

4 January. The Will of William Adcock late of Esher late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1923 at Ashby-de-la-Zouch was proved at Leicester by William Adcock of Ashby-de-la-Zouch Carpenter the Son and one of the Executors.

ADCOCK William.
Personal Estate under £10,000.

8 April. The Will of William Adcock late of Syden in the County of Leicestershire Gentleman who died 12 March 1929 at Syden was proved at Leicester by Thomas White of Bressat in the said County Gentleman and John Hughes of the Clung Hamlet Leicestershire in the said County Gentleman the Executors.

ADBOOTT Mary.
Personal Estate under £1,000.

10 August. The Will of Mary Adboott late of Haxham in the County of Bedford Widow who died 2 July 1923 at Haxham was proved at Chichester by William Ludlow Thomas of Haxham Esquire and Henry Mansel of Stopley in the said County Barrister the Heiress the Executors.

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^a Huge thanks to RAs who created training set per year!

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1879.

ADCOCK Florence Charlotte.

Personal Estate under £6,500.

4 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Belmont in the County of Surrey who died 29 December 1878 at 4 Parkhill was proved at the Principal Registry by the said Edward Adcock of 4 Park Hill Great Queen the sole Executor. Probate being granted under certain Limitations.

ADCOCK George.

Personal Estate under £100.

21 Jan. Administration of the Personal Estate of George Adcock late of 11 Parliament-street Haxley in the County of Stafford Haxley who died 4 June 1879 at 11 Parliament-street was granted at Lichfield to Anna Adcock of 23 Parkmans-lane Widow the Heir.

ADCOCK John David.

Personal Estate under £100.

9 February. The Will of John David Adcock formerly of Tamworth in the Parish of Balolai and Glamote last late of 20 Street-end Chapel Buntingham last in the County of Warwick Glamote who died 2 December 1878 at 20 Street-end was proved at Birmingham by Sarah Anna Adcock of 69 Stratford-road Widow the Heir the sole Executrix.

ADCOCK John Thomas.

Personal Estate under £25.

5 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Thomsen-street Spitalwick in the Parish of King's Norton in the County of Worcester Glamote a Widower who died 12 January 1879 at 13 Thomsen-street was proved at Worcester to Anne Taylor (Wife of James Taylor) of 22 Rood-end Camp Hill Buntingham in the County of Warwick the Daughter and one of the Next of Kin.

ADCOCK Thomas.

Personal Estate under £100.

10 February. The Will of Thomas Adcock late of Kirby Bellon in the County of Leicestershire Farmer who died 5 December 1878 at Kirby Bellon was proved at Leicester by Mary Ann Adcock of Kirby Bellon Widow the Heir the sole Executrix.

ADCOCK William.

Personal Estate under £100.

4 January. The Will of William Adcock the Elder late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1878 at Ashby-de-la-Zouch was proved at Leicester by William Adcock of Ashby-de-la-Zouch Carpenter the Son one of the Executors.

ADCOCK William.

Personal Estate under £100.

8 April. The Will of William Adcock late of Syden in the County of Leicestershire Gardener who died 12 March 1879 at Syden was proved at Leicester by Thomas White of Bressall in the said County Gardener and John Hughes of the Clay Workhouse Leicestershire in the said County Gardener the Executors.

ADDSBOTH Mary.

Personal Estate under £1,000.

10 August. The Will of Mary Addsbott late of Haxham in the County of Berks Widow who died 2 July 1878 at Haxham was proved at Chichester by William Ludlow Thomas of Haxham Berks and Henry Somersall of Shipley in the said County Berks the Heirs the Executors.

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1879.	
ADCOCK Florence Charlotte. Personal Estate under £6,000.	1 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Boulevard in the County of Surrey who died 24 December 1933 at 4 Parkhill was proved at the Principal Registry by the said Edward Adcock of 4 Parkhill Greater London the Executor. Probate being granted under certain Limitations.
ADCOCK George. Personal Estate under £100.	21 June. Administration of the Personal Estate of George Adcock late of 11 Parliament-street Handel in the County of Stafford Handel who died 4 June 1935 at 11 Parliament-street was granted to Litchfield in Assets Adcock of 39 Parliament-street Widow the Heir.
ADCOCK John David. Personal Estate under £100.	1 February. The Will of John David Adcock formerly of Tottenham in the Parish of St. Paul and Glenside late late of 20 Shaftesbury-road Churchill Birmingham born in the County of Warwick Gloucester died 2 December 1935 at 20 Shaftesbury-road was proved at Birmingham by Sarah Anna Adcock of 68 Shaftesbury-road Widow the Heir the sole Executrix.
ADCOCK John Thomas. Personal Estate under £50.	2 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Unnamer-street Spenshaw in the Parish of King's Norton in the County of Worcester Gloucester a Widower who died 10 January 1935 at 13 Thomas-street was proved at Worcester by Anne Thelma Adcock (Wife of John Thelma) of 22 Kensington Camp Hill Birmingham in the County of Warwick the Daughter and sole of the Heir of him.
ADCOCK Thomas. Personal Estate under £1,000.	10 February. The Will of Thomas Adcock late of 10 Parkhill in the County of Leicester former who died 3 December 1935 at 10 Parkhill was proved at Leicester by Mary Ann Adcock of 10 Parkhill Widow the Heir the sole Executrix.
ADCOCK William. Personal Estate under £100.	1 January. The Will of William Adcock the Elder late of Ashby-de-la-Zouch in the County of Leicestershire who died 24 July 1935 at Ashby-de-la-Zouch was proved at Leicestershire by William Adcock of Ashby-de-la-Zouch Carpenter the Heir the sole of the Executors.
ADCOCK William. Personal Estate under £10,000.	1 April. The Will of William Adcock late of Boston in the County of Leicestershire Gloucester who died 18 March 1935 at Boston was proved at Leicestershire by Thomas White of Boston in the said County Gloucester and John Whigham of the City of Birmingham Leicestershire in the said County Gloucester the Executors.
ADBOOY Mary. Personal Estate under £1,000.	10 August. The Will of Mary Adbooy late of Hoxton in the County of Essex Widow who died 4 July 1935 at Hoxton was proved at Chichester by William Joseph Thomas of Hoxton Essex and Henry Somerset of Bishop in the said County. Heir. the Heir the Executors.

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^a Huge thanks to RAs who created training set per year!

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1879.	
ADCOCK Florence Charlotte. Personal Estate under £1,000.	4 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Belmont in the County of Surrey who died 24 December 1878 at 4 Parkhill Belmont in the County of Surrey. Registry by the said Edward Adcock of 4 Parkhill Belmont the sole Executor. Probate being granted under certain Limitations.
ADCOCK George. Personal Estate under £100.	21 June. Administration of the Personal Estate of George Adcock late of 11 Parliament-street in the County of Staffordshire who died 4 June 1878 at 11 Parliament-street was granted on 21 June 1878 to Anna Adcock of 30 Parliament-street Widow the Heir.
ADCOCK John David. Personal Estate under £100.	1 February. The Will of John David Adcock formerly of Tottenham in the Parish of St. John and Glanton but late of 20 Street-road Churchill Birmingham born in the County of Warwick (Glasgow) died 2 December 1878 at 20 Street-road was proved at Birmingham by Sarah Anna Adcock of 68 Stratford-road Widow the Heir the sole Executrix.
ADCOCK John Thomas. Personal Estate under £50.	2 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Unnamet-street Spetchworth in the Parish of King's Norton in the County of Worcester (Glasgow) a Widower who died 12 January 1878 at 13 Thomas-street was proved at Worcester by Anne-Phoebe Wilkin (Daughter) of 22 Kensington Camp Hill Birmingham in the County of Warwick the Daughter and one of the Next of Kin.
ADCOCK Thomas. Personal Estate under £1,000.	10 February. The Will of Thomas Adcock late of 14 Parkhill Belmont in the County of Leicestershire (Glasgow) who died 24 December 1878 at 14 Parkhill Belmont was proved at Leicester by Mary Ann Adcock of 14 Parkhill Belmont Widow the Heir the sole Executrix.
ADCOCK William. Personal Estate under £100.	1 January. The Will of William Adcock late of 14 Parkhill Belmont in the County of Leicestershire (Glasgow) who died 24 July 1878 at 14 Parkhill Belmont was proved at Leicester by William Adcock of 14 Parkhill Belmont the sole Executor.
ADCOCK William. Personal Estate under £10,000.	14 April. The Will of William Adcock late of 14 Parkhill Belmont in the County of Leicestershire (Glasgow) who died 24 July 1878 at 14 Parkhill Belmont was proved at Leicester by William Adcock of 14 Parkhill Belmont the sole Executor.
ADBOOY Mary. Personal Estate under £1,000.	10 August. The Will of Mary Adbooy late of 14 Parkhill Belmont in the County of Leicestershire (Glasgow) who died 24 July 1878 at 14 Parkhill Belmont was proved at Leicester by William Adbooy Thomas of 14 Parkhill Belmont the sole Executor.

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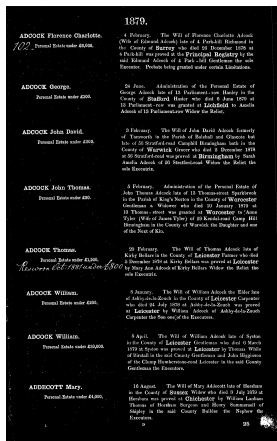
1879.

ADCOCK Florence Charlotte. Personal Estate under £6,500.	4 February. The Will of Florence Charlotte Adcock (Wife of Edward Adcock) late of 4 Parkhill Mansions in the County of Surrey who died 20 December 1878 at 4 Parkhill was proved at the Principal Registry by the said Edward Adcock of 4 Parkhill Court Gates the sole Executor. Probate being granted under certain Limitations.
ADCOCK George. Personal Estate under £100.	26 June. Administration of the Personal Estate of George Adcock late of 11 Parliament-street Haxley in the County of Stafford Haxley who died 4 June 1878 at 11 Parliament-street was granted at Litchfield to Anna Adcock of 23 Parkmansmore Widow the Heiress.
ADCOCK John David. Personal Estate under £100.	9 February. The Will of John David Adcock formerly of Tenworth in the Parish of Rotherham and Gloucester last late of 20 Street-end Chapel Broomfield both in the County of Warwick Gloucester who died 2 December 1873 at 20 Street-end was proved at Birmingham by Sarah Anna Adcock of 69 Stratford-road Widow the Heiress the sole Executrix.
ADCOCK John Thomas. Personal Estate under £25.	5 February. Administration of the Personal Estate of John Thomas Adcock late of 13 Thomsenstreet Spitalfields in the Parish of King's Norton in the County of Worcester Gloucestershire a Widower who died 10 January 1873 at 13 Thomsen-street was proved at Worcester to Anne Taylor (Wife of James Taylor) of 22 Rotherham-street Hill Broomfield in the County of Warwick the Daughter and one of the Next of Kin.
ADCOCK Thomas. Personal Estate under £100.	10 February. The Will of Thomas Adcock late of Kirby Bellon in the County of Leicestershire Farmer who died 5 December 1873 at Kirby Bellon was proved at Leicester by Mary Ann Adcock of Kirby Bellon Widow the Heiress the sole Executrix.
ADCOCK William. Personal Estate under £200.	4 January. The Will of William Adcock the Elder late of Ashby-de-la-Zouch in the County of Leicestershire Carpenter who died 24 July 1873 at Ashby-de-la-Zouch was proved at Leicester by William Adcock of Ashby-de-la-Zouch Carpenter the Son one of the Executors.
ADCOCK William. Personal Estate under £10,000.	9 April. The Will of William Adcock late of Syden in the County of Leicestershire Gentleman who died 12 March 1873 at Syden was proved at Leicester by Thomas White of Bressat in the said County Gentleman and John Hughes of the Chapel Hamlet Leicestershire in the said County Gentleman the Executors.
ADDSOOTY Mary. Personal Estate under £1,000.	10 August. The Will of Mary Addsooty late of Haslem in the County of Bristol Widow who died 3 July 1873 at Haslem was proved at Gloucester by William Ludlow Thomas of Haslem Ryeport and Henry Somerset of Strickley in the said County Builders the Heiress the Executors.

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^aHuge thanks to RAs who created training set per year!

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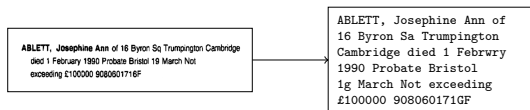
^aHuge thanks to RAs who created training set per year!

OCR and rules extract names, dates, places, wealth

ABLETT, Josephine Ann of 16 Byron Sq Trumpington Cambridge
died 1 February 1990 Probate Bristol 19 March Not
exceeding £100000 9080801716F

Amazon Web Services. (2023). *Amazon Textract* (Version 1.4.5). URL: aws.amazon.com/textract/
 OCRfixr development team. (2023). *OCRfixr* (Version 1.5.1) [Python package]. URL: pypi.org/project/OCRfixr/
 FuzzyWuzzy development team. (2020). *fuzzywuzzy* (Version 0.18.0) [Python package]. URL: pypi.org/project/fuzzywuzzy/

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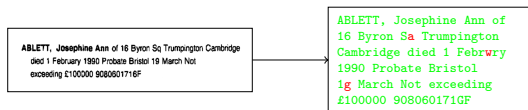


Amazon Web Services. (2023). *Amazon Textract* (Version 1.4.5). URL: aws.amazon.com/textract/

OCRFixr development team. (2023). *OCRFixr* (Version 1.5.1) [Python package]. URL: pypi.org/project/OCRFixr/

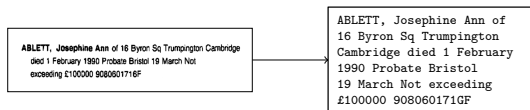
FuzzyWuzzy development team. (2020). *fuzzywuzzy* (Version 0.18.0) [Python package]. URL: pypi.org/project/fuzzywuzzy/

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OCR and rules extract names, dates, places, wealth

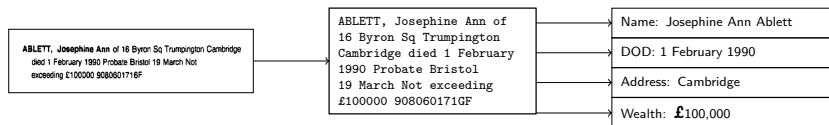


Amazon Web Services. (2023). *Amazon Textract* (Version 1.4.5). URL: aws.amazon.com/textract/

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OCR and rules extract names, dates, places, wealth



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FuzzyWuzzy development team. (2020). *fuzzywuzzy* (Version 0.18.0) [Python package]. URL: pypi.org/project/fuzzywuzzy/

FreeBMD captures death-record fields

Entry Information

This entry was created from the following transcription:

Surname Given Name Age District Volume Page Transcriber

Deaths Jun 1919

BURROWS Mary A. 95 Ipswich 4a 907 [jscoleman](#)

Surname: Burrows

Given name: Mary A.

Age at death: 95

District: Ipswich

County: Suffolk

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths-q1y1940.q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
acock	john	<NA>	bristol	85
acomb	thomas	nicholson	york	28
...	...	...	...	...

deaths-q1y1939.q4

surname	name	middlename	location	age
acland	arthur	charles	cheltenham	61
...	...	...	...	...

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths-qi1940.q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
acock	john	<NA>	bristol	85
acomb	thomas	nicholson	york	28
...	...	...	...	...

deaths-qi1939.q4

surname	name	middlename	location	age
acland	arthur	charles	cheltenham	61
...	...	...	...	...

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths_q1y1940.q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
acock	john	<NA>	bristol	85
acomb	thomas	nicholson	york	28
...	...	...	...	...

deaths_q1y1939.q4

surname	name	middlename	location	age
acland	arthur	charles	cheltenham	61
...	...	...	...	...

output

surname	name	dod	wealth	age
ackroyd	william	02-03-1940	5895	73
acock	john	03-01-1940	543	85
acland	arthur	26-11-1939	3025	61
...	...	...	...	...

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths-qiy1940-q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
ackroyd	william	<NA>	middlesex	5
ackroyd	william	scott	dorset	37
ackroyd	william	herbert	york	28

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths-qiy1940-q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
ackroyd	william	<NA>	middlesex	5
ackroyd	william	scott	dorset	37
ackroyd	william	herbert	york	28

The key link is wealth record to death record

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surname	name	middlename	location	dod	wealth
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acland	arthur	charles	cheltenham	26-11-1939	3025
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deaths-qiy1940-q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
ackroyd	william	<NA>	middlesex	5
ackroyd	william	scott	dorset	37
ackroyd	william	herbert	york	28

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths-qiy1940-q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
ackroyd	william	<NA>	middlesex	5
ackroyd	william	scott	dorset	37
ackroyd	william	herbert	york	28

The key link is wealth record to death record

probate

surname	name	middlename	location	dod	wealth
ackroyd	william	herbert	ruislip	02-03-1940	5898
acland	arthur	charles	cheltenham	26-11-1939	3025
acock	john	<NA>	bristol	03-01-1940	543
acomb	thomas	nicholson	york	22-03-1940	585

deaths-qiy1940.q1

surname	name	middlename	location	age
ackroyd	william	herbert	middlesex	73
ackroyd	william	<NA>	middlesex	5
ackroyd	william	scott	dorset	37
ackroyd	william	herbert	york	28

output

surname	name	dod	wealth	age
ackroyd	william	02-03-1940	5895	73

Life tables turn linked deaths into survival estimates

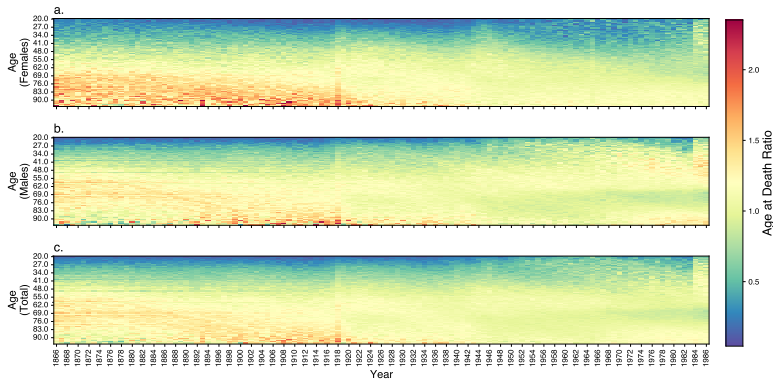
We stress-test results across cohorts, wealth groups, matching rules, and smoothing choices.

- We estimate 9,720 life-table specifications.
- We use single-year ages, not abridged life tables.
- Sparse late-age deaths can make unsmoothed life tables fail.
- `pc1m` smoothing handles sparse cells where needed.
- Python 3.12 code will be released with the pre-print:

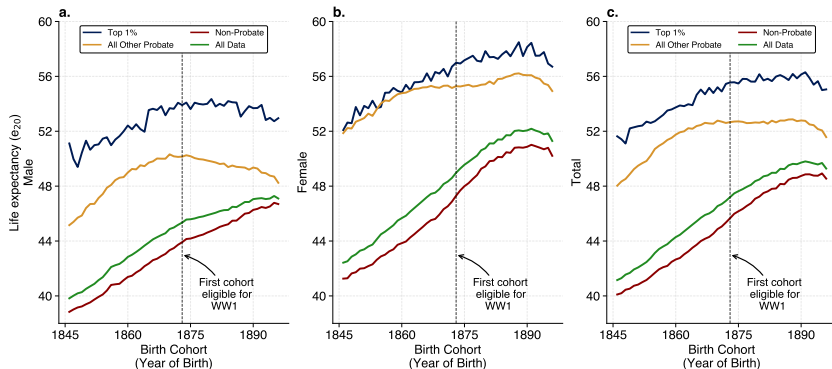
`github.com/reeves-projects/health-wealth`

Riffe, T. et al. (2019). DemoTools: An R package of tools for aggregate demographic analysis. [R package]. URL: <https://github.com/timriffe/DemoTools/>

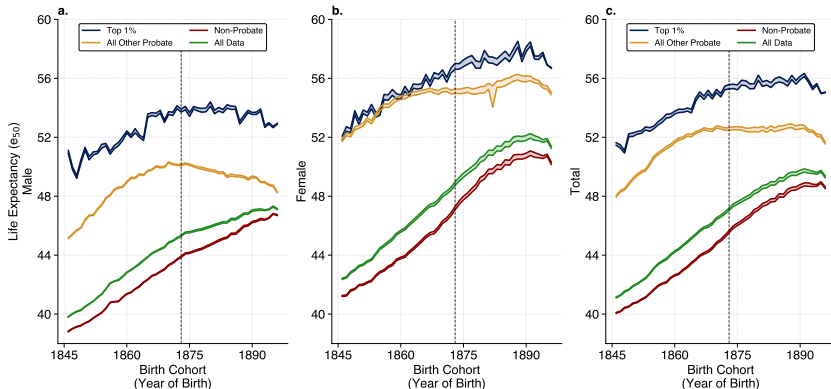
Probate and non-probate deaths differ by age



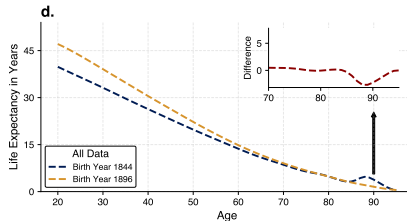
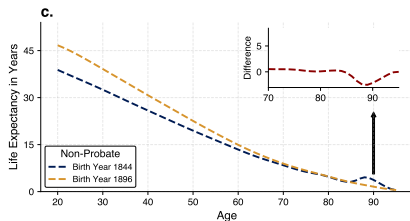
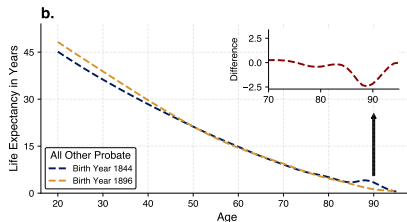
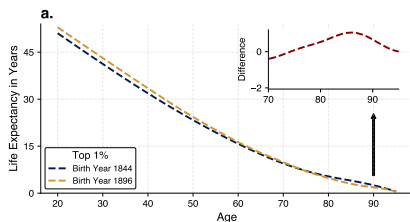
We estimate cohort life expectancy by wealth



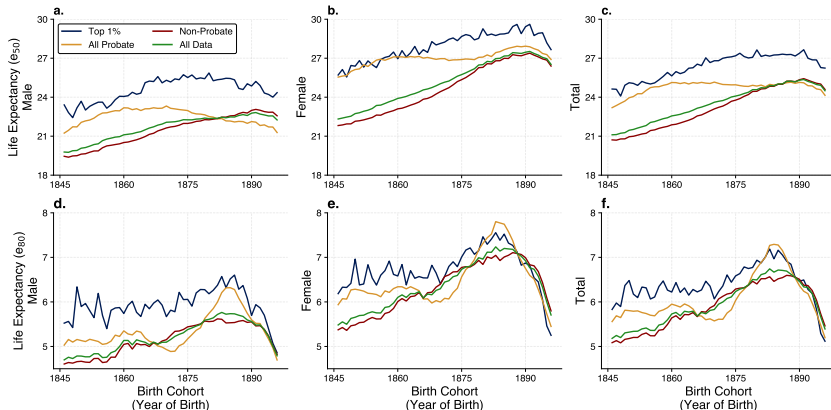
Robustness checks vary cohorts and smoothing



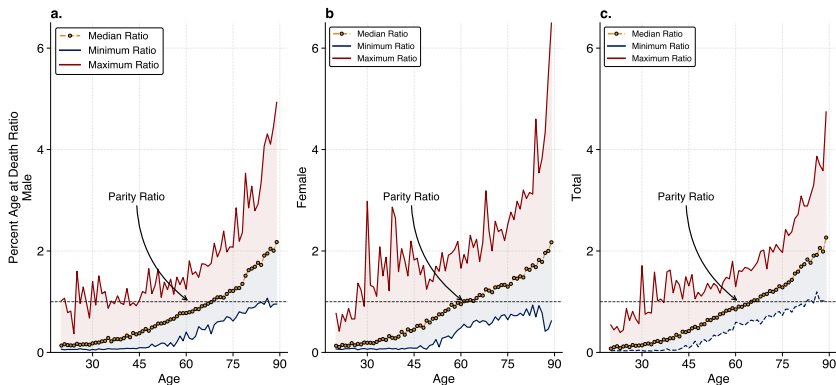
Inequalities are visible across benchmark cohorts



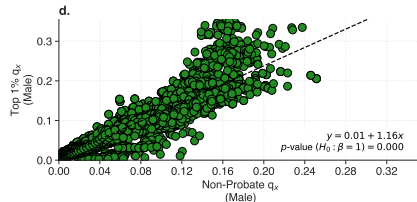
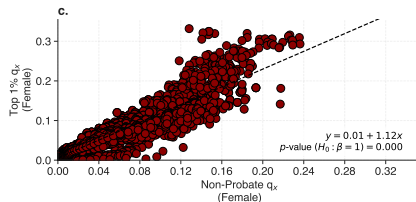
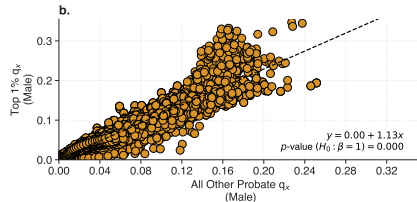
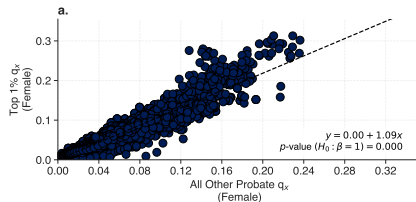
The wealth gradient persists at older ages



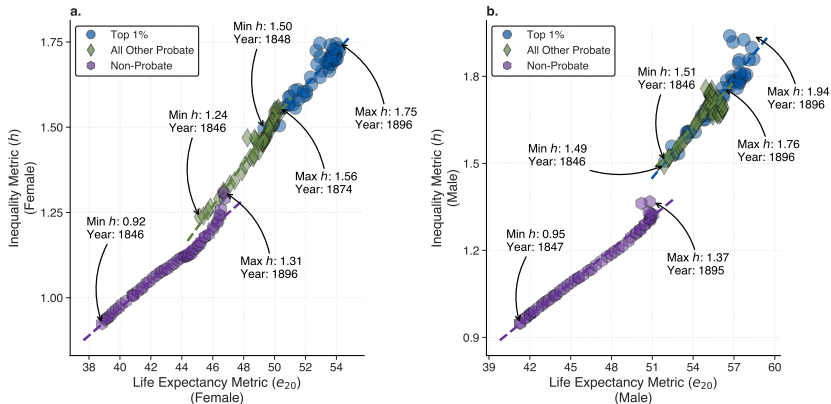
The wealthiest deaths are shifted to older ages



Survival probabilities expose where gaps emerge



Lifespan inequality changes with wealth



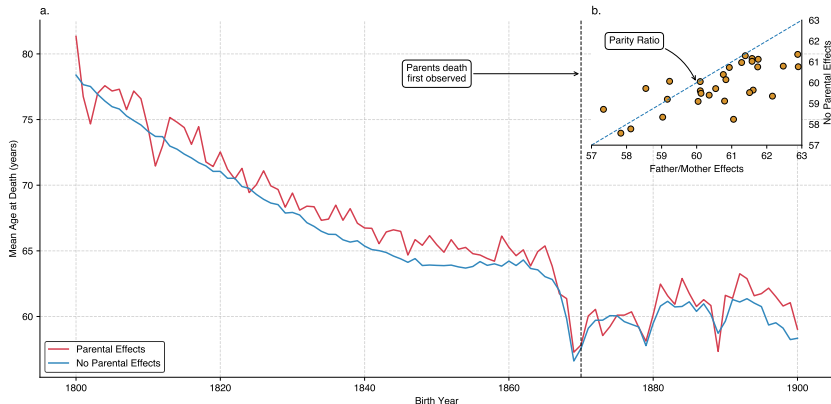
WikiTree adds intergenerational context



- Collaborative genealogy platform for family-tree research.
- Users contribute to one shared global family tree.
- API access covers **36 million records** globally.
- This lets us stratify e_0 by **parental wealth at death**.

Why genealogies matter: wealth at death mixes lifetime resources with late-life spend-down or accumulation. Parental wealth lets us ask the life expectancy of people **born into wealth**.

Parental wealth links genealogy to mortality



Wealth predicts who reaches old age, how long they live, and how advantage carries across generations.

1. Probate is selected, not neutral.

Probate deaths are older; the wealthiest are shifted furthest towards later ages.

3. Gaps persist at older ages.

Survival probabilities and e_{50}/e_{80} estimates locate where inequality remains visible.

2. Own wealth predicts life expectancy.

Cohort life tables show a durable gradient across benchmark cohorts and robustness checks.

4. Family wealth adds context.

WikiTree links move the analysis from personal estates to parental wealth.

The project turns administrative records into a population-scale account of health inequality over the very long run.

Thanks to all the wonderful collaborators!

