Measuring Mortality During the Covid-19 Pandemic

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Challenge & Context

- Collect timely, inclusive and accurate information on deaths
Solution, in short

• Monitor death notices, using RIP.ie
Historical Comparisons
A Journal of the Plague Year

- Daniel Defoe’s Fictional account of London’s bubonic plague (1665), published in **1722**
- Tale begins in September 1664, when rumours circulate of the return of ‘pestilence’ to Holland
- Next comes the first suspicious death in London, in December, and then, come spring……….
A Journal of the Plague Year

- ...Defoe describes how *death notices* posted in local parishes have taken an ominous rise.

**Source:** https://www.bbc.com/culture/article/20200413-what-can-we-learn-from-pandemic-fiction
A Week of Parish Death Notices, London, 1665

- “Bill of Mortality” showing Death Tally of all city parishes for the week of Aug. 15-22, 1665, when the plague had infected 96 of the 130 parishes reporting.

“A Method of Dealing with Unregistered Deaths”

- Journal of the American Statistical Association
- Volume 10, **1907**, Issue 80
- Marshall Langton Price M.D., State Board of Health, Maryland, U.S.A.
- “The...method is founded upon......”
“A Method of Dealing with Unregistered Deaths”

• “…death notices appearing in local papers.

• The method has been used recently to determine the efficiency of registration in the registration areas, and

• is in general more accurate and complete than that obtained by the [Maryland census] enumerators.”
Death Registration in Ireland
Death Registration in Modern Ireland

- Not the responsibility of a modern census enumerator, who counts people alive and in the state on census night, once every 5 years.
- Death registration is a statutory requirement, with individuals’ responsibilities set out in The Civil Registration Act 2004.
37.—(1) When a death occurs in the State, it is the duty of

(a) a relative of the deceased who has knowledge of the required particulars in relation to the death, and

(b) if there is no such relative who can be found or every such relative is incapable through ill health of complying with this subsection, each other qualified informant, unless he or she reasonably believes that another qualified informant has complied with it in relation to the death within 3 months from the date of the death to give to any registrar the required particulars of the death in the form standing specified for the time being by an tArd-Chláraithoír.
Current Registration practice poses difficulty

- Three months is quite long, especially during a pandemic
- Lengthy delays can be experienced, for example, due to involvement of the Coroner, Gardaí, DPP, HSA
- Ratio of deaths to coroners is highest in Dublin, meaning higher workloads
- Registered Deaths as a percentage of actual deaths is clearly affected by personal compliance with the Act
- Non-compliance could be due to a variety of factors

Coronial Involvement

• 2007, 43% of deaths (12,124 out of 28,117)
• 2017, 57% of deaths (17,337 out of 30,418)
• Why the increase?
• Response from Coroner’s Society of Ireland:
  • “explanation is primarily legislative…there is an increased reporting of cases subsequent to 2007”
  • “..all nursing home deaths are reported, as are all neonatal deaths and still births”
  • “refer…to 2nd Schedule of Coroners Amendment Act 2019, as to Deaths reportable to a Coroner”
  • “see full list of reportable deaths, which is much increased on the previous 1962 reportable cases”
www.rip.ie

- Privately-owned company
- Has become a popular website to notify deaths and provide funeral details
- Used by Irish and Northern Irish citizens and expatriates
- 150,000 hits per day
- (The CSO are grateful to RIP.ie for permission to use their website)
www.rip.ie

- Only funeral directors can post a notice using a secure login, ensuring the data is of good quality and duplicates are rare
- Irish custom of holding funerals within two to three days following death
- Notices are placed in a fast and efficient manner, usually within 1 day of death
• The combination of these market and cultural forces have made RIP.ie a valuable crowd-sourced means of tracking deaths

• As close to “real-time” public death notifications as are available

• When compared with the statutory time limit of 3 months for the registrations of deaths in the State, this is a opportune data source for monitoring trends in mortality during the pandemic.
Death Notice Publication Process

Publish a death notice

To publish a death notice on RIP.ie, simply ask your funeral director to do so. This is a free service to bereaved families and all funeral directors in Ireland have secure access to the site for the purpose of publishing death notices for funerals which they are undertaking.

In cases where, for example, a funeral is taking place abroad, the family can contact RIP.ie directly and we will liaise with the funeral director who is handling the arrangements.

Given the sensitive nature of the information on RIP.ie, we cannot accept notices directly from the public. Similarly, we cannot make changes to a notice published on the site by a funeral director. Such changes can only be made by the funeral director.

The only way to guarantee that a notice appears on RIP.ie is if the funeral director publishes the notice on the site.

Source: https://rip.ie/article.php?AID=52
Sample Death Notice Structure (Mock-up)

**The death has occurred of Martin Aaron**
Anagassan, Louth / Borris Carlow

Aaron, Martin (9 South Street, Annagassan, Co. Louth and formerly of Borris, Co. Carlow). Suddenly, but peacefully, in the presence of his loving family. Beloved husband of Anne (nee Moran) and father of Martin, Leo, Anita and Jane; sadly missed and lovingly remembered by his wife, daughters, sons, brother Jim and Tom, sisters Alice (O’Connor), Molly (Doilan) and Nellie (Lavelle), grandchildren, daughters-in-law, son-in-law, nieces, nephews, sisters-in-law, brothers-in-law, cousins and a large circle of friends.

**Rest in Peace.**
Reposing at The Community Mortuary Chapel tomorrow evening, Friday, from 5.30pm with removal at 8pm to St. Monica’s Church, Durrin. Requiem Mass on Saturday at 11.30am. Burial afterwards in the adjoining cemetery.

**Date Published:** Monday 1st January 2016

**Date of Death:** Saturday 30th December 2015

Source: [http://ripservices.ie/FamilyNotices/DeathNotice_Ack.htm](http://ripservices.ie/FamilyNotices/DeathNotice_Ack.htm)
Monthly Deaths by Occurrence (CSO) vs rip.ie death notices January 2016 to December 2017

Correlation > 0.99
Approach

- Scrape regularly
- Read all death notices
- Clean & Classify
- Tabulate
- 12 months complete – October 2019 to September 2020
- Time consuming but good quality results and provides reliable training and test-data for potential automated classification
Scraped Variables

- Unique ID
- Names
- Addresses (sometimes Northern Ireland, overseas)
- Date of Publication
- Date of Death (sometimes missing)
- Metadata aka Death Notice or Obituary (often informative)
Derived Variable - Gender

- Circa 1,100 names were manually coded
- Personal pronouns etc: As metadata contains “hints” as to the gender, e.g. “née”, “mother of”, “husband to” etc., it was useful in a formulaic means of classification. This was initially checked against the 1,100 and is superior as ambiguous names (e.g. Pat, Fran) would otherwise need manual intervention
- Combination of both yields high accuracy, requiring rare manual coding
Northern Ireland Death Notices

- NI deaths often contain UK postcode, all of which begin with “BT” in the 6 counties
- Deceased may have an address on each side of border
- Therefore, metadata (death notice) is searched for mention of 6 counties or string “BT”.
- Best to read each suspected NI death notice as it can be a legitimate RoI death
- NI deaths make up just under half of non-RoI deaths
- Publication Lag ≈ 1.3 Days
Overseas Deaths

- Generally occur in expatriate strongholds
- UK: London, Manchester, Birmingham
- North America: New York, New Jersey, Massachusetts, Toronto
- Antipodes: New Zealand, Australia
- Common to find death notices for emigrant missionaries
- Likely holiday deaths, e.g. Spain, are deemed to be Irish deaths and relevant to Irish official statistics, unlike expat deaths where the deceased had made a new life there e.g. married, had children – often clear from the metadata, negligible
- Just over half of non-RoI deaths
- Publication Lag $\approx 11.7$ days
Place of Death – Manually Coded

- Each death notice is **read** to determine place of death
  - If Overseas (expatriate) or Northern Ireland then it is removed
  - Otherwise, it is coded to Hospice, Hospital, Nursing Home, At Home or Other
  - Other includes Accidents, on Holiday or Other Residential e.g. Convents, Assisted Living
Results and Conclusions in Initial Publication
Evaluation of RIP.ie

- The [www.rip.ie](http://www.rip.ie) service is an excellent substitute for a statutory near-real-time mortality feed, with a lag of just over 1 day
- The solemnity of the event and relationship between funeral directors and rip.ie underpins the quality of the data – funeral directors are competent records keepers
- The correlation between rip.ie and the CSO death by occurrence for the months of 2016 and 2017 at over 0.99 is reassuring
- Rip.ie competently tracked the daily Covid-19 deaths, as notified to the government
- Metadata provides useful information on the place of death, especially nursing homes at such a critical time
- Potential blindspot due to lower coverage of minorities
Weekly Time-lapse comparison of Death Registrations vs Death Notices (Rip.ie)
October 1\textsuperscript{st} 2019 to 30\textsuperscript{th} June 2019

Source: Central Statistics Office
Cleaned Death Notices by Gender, by Month (n = 32,104)
October 2019 to September 2020, Source www.rip.ie
Cleaned Death Notices by Place of Death, by Month (n = 32,104) October 2019 to September 2020, Source www.rip.ie

- Hospital
- HIQA-regulated Older Person’s Facility (Nursing Home)
- Hospice
- At Home
- Other / Unclear / Not Stated
Thank You

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