

Supplementary files: Cross-national commonalities and differences in place of death from international comparative death certificate studies: a systematic review

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Supplementary File 1. Full Search strategy

Search strategy in MEDLINE (1946 – December 2, 2024), Embase (1974-2024, December 2) and Psycinfo (1806 – December 2024) (via Ovid)

1	((place* or location* or site* or setting* or context* or where or home or hospital* or hospice*) adj3 (death* or dying or die*)).mp
2	(death certificat* or death registr* or statistic* or all deaths or all persons or all individuals or all population or whole population).mp
3	(countries or multicountry or multi-country or cross-national or global or multinational or international).mp
4	1 and 2 and 3

Search strategy in CINAHL (1961 – 2024, December 2nd)

S1	((place* or location* or site* or setting* or context* or where or home or hospital* or hospice*) N2 (death* or die* or dying)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase
S2	(death certificat* or death registr* or statistic* or all deaths or all persons or all individuals or all population or whole population)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase
S3	(countries or multicountry or multi-country or cross-national or global or multinational or international)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase
S4	S1 AND S2 AND S3	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase

Search Strategy in Web of Science (1964-2024, December 2nd)

1	TS=((place* or location* or site* or setting* or context* or where or home or hospital* or hospice*) NEAR/2 (death* or die* or dying)) AND TS=(death certificat* or death registr* or statistic* or all deaths or all persons or all individuals or all population or whole population) AND (TS=(countries or multicountry or multi-country or cross-national or global or multinational or international)
2	TS=(death certificat* or death registr* or statistic* or all deaths or all persons or all individuals or all population or whole population)
3	TS=((place* or location* or site* or setting* or context* or where or home or hospital* or hospice*) NEAR/2

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	(death* or die* or dying))
4	1 and 2 and 3

Renowned international organizations' websites (i.e., CORDIS, WHO, and OECD) were also searched, where more straightforward strategy was adopted to adjust to the different platforms.

Search Strategy in CORDIS (<https://cordis.europa.eu/search/en>)

1	"place of death" Including 'archived content' (9 results)
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Search Strategy in OECD iLibrary (<https://www.oecd-ilibrary.org/>)

1	"place of death" (32 results)
2	"mortality data" (567 results)
1+2	346 results

Search Strategy in WHO Institutional repository for information sharing (<https://iris.who.int/>)

1	"place of death" on ALL of IRIS No filters 198 results (-1 duplicate record) = 197
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Supplementary File 2. Piloted Data Extraction Form

Study information	ID
	Authors/Study Name
	Corresponding author contacts
	Country of corresponding author (first affiliation)
	Publication Year
	Title
	Aim
	Data from countries merged (Y/N)
	Study/Report type
	Study analyses factors? (Y/N)
Population	Inclusion and exclusion criteria (with number of deceased for each criterion)
	Sample size (total and per country)
	Sample characteristics (age, gender and cause of death) for all countries
Countries	Number of countries
	List of countries (region, if applicable)
Data sources	Data sources (per country, if it varies between countries)
Study period	Period (per country, if it varies between countries)
Place of death (outcome) classification	Original categories of place of death
	Studied categories of place of death
	Percentage of deaths per place (place, number of deaths and %)
Associated factors	Statistical measure used and place of death association reported n (ex: Odds ratio for hospital death, Logistic regression, logit estimates of probability of home death)
	Total number of factors
Illness related factors	Number of studied factors related to illness
	Studied factors related to illness
	Effect size reported (only significant results found $p < 0.05$)
Individual factors	Number of individual factors
	Studied individual factors
	Effect size reported (only significant results found $p < 0.05$)
Environmental factors	Number of environmental factors
	Studied environmental factors
	Effect size reported (only significant results found $p < 0.05$)
Study quality (NOS score)	Selection - Representativeness of the sample
	Selection - Excluded
	Selection - Ascertainment of confounders
	Comparability
	Outcome - Assessment of outcome
	Outcome - Statistical testing
	Selection
	Comparability
	Outcome
	Total score

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Supplementary File 3. NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE

(adapted by Patra et al., 2015¹ for cross-sectional studies in a meta-analysis of second-hand smoke and the risk of tuberculosis in children and adults, and further adapted by us to our systematic review on cross-national commonalities and differences in place of death from international comparative death certificate studies)

Selection (maximum 3 stars)

- 1) Representativeness of the sample (deaths in each country)
 - a) Truly representative of the average in the target population in each country (all deaths or random sample of deaths)*
 - b) Somewhat representative of the average in the target population in each country (non-random sample of deaths)*
 - c) Selected group of users in the target population in each country (e.g. non-random sample of deceased with certain causes of death)
 - d) No description of the sampling strategy in each country
- 2) Excluded (eligible deceased excluded, for example due to missing data)
 - a) The inclusion rate is satisfactory or the comparability between included and excluded characteristics is established*
 - b) The inclusion rate is unsatisfactory, or the comparability between included and excluded is unsatisfactory
 - c) No description of inclusion rate or the characteristics of included and excluded
- 3) Ascertainment of confounders (factors that may explain differences in place of death between countries, such as age, gender and cause of death)
 - a) Reliable or validated measurement (e.g., from death certificate data)*
 - b) Non-validated measurement at risk of bias, but source is available or described
 - c) No description of the measurement source

Comparability (maximum 2 stars)

- 1) The subjects in the different countries and outcome groups (places of death) are comparable, with confounding factors controlled for in the study design (e.g. matching groups) or analysis (e.g. via adjusted estimates, multivariable analysis).
 - a) The study controls for the most important factors – age, gender and cause of death.**
 - b) The study control for any additional factor.*
 - c) The study does not control for confounders or provides no information to demonstrate.

Outcome (maximum 2 stars)

- 1) Assessment of the outcome (place of death)
 - a) Coding used in analysis is exactly the same as original coding in death certificates.*
 - b) Any recoding of the original is made clear and procedure is comparable across countries.*
 - c) Unclear how place of death was originally coded in death certificates and if any recoding.
 - d) No description.
- 2) Statistical testing
 - a) The statistical tests used to analyse the data are clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and/or the probability level (p value).*
 - b) Statistical tests are not required since the data refer to the whole population (all deaths), the data are reported only using descriptive statistics.*
 - c) The statistical tests used are not appropriate, not described or are incomplete.
 - d) No statistical tests were used, the data are reported only using descriptive statistics, and the data refer to only a sample of the population (random or non-random) requiring inferential statistics.

¹¹Patra, J., Bhatia, M., Suraweera, W., et al., 2015. Exposure to second-hand smoke and the risk of tuberculosis in children and adults: a systematic review and meta-analysis of 18 observational studies. PLoS Med. 12 (6), e1001835. <https://doi.org/10.1371/journal.pmed.1001835>

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Supplementary File 4. Script used to plot deaths at home using Python 3.12.12 on a Google Colab environment.

This script was developed with assistance from ChatGPT (OpenAI).

The code and its outputs were reviewed and tested for accuracy.

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Forest plot: Deaths at home

=====

!pip install pandas openpyxl matplotlib

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from google.colab import files

Upload Home_PoD.xlsx

uploaded = files.upload()

Load data

df = pd.read_excel('Home_PoD.xlsx')

Remove accidental spaces from column names

df.columns = df.columns.str.strip()

Sort by decreasing maximum home-death percentage

df_sorted = df.sort_values('HOME Max', ascending=False).reset_index(drop=True)

countries = df_sorted['Country Name_home']

y = np.arange(len(df_sorted))

fig, ax = plt.subplots(figsize=(7, 12))

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```
# Shaded area >= 50%

max_x = max(df_sorted['HOME Max'].max(), 100)

min_val = df_sorted['HOME - Min'].min()

ax.axvspan(50, max_x, color='0.97', zorder=0)


# Axis limits and ticks

ax.set_xlim(left=min_val - 5, right=max_x)

ax.set_xticks(np.arange(0, max_x + 1, 10))


# Income group (HIC vs others)

is_hic = df_sorted['Incomegroup_home'].eq('HIC')

idx_hic = np.where(is_hic)[0]

idx_nonhic = np.where(~is_hic)[0]


def plot_group(indices, color, label):

    if len(indices) == 0:

        return

    ax.hlines(

        y[indices],

        df_sorted.loc[indices, 'HOME - Min'],

        df_sorted.loc[indices, 'HOME Max'],

        color=color,

        linewidth=1.3,

        zorder=2,

        label=label

    )

    ax.scatter(

        df_sorted.loc[indices, 'HOME - Min'],

        y[indices],

        facecolor=color,

        edgecolor=color,
```

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```
marker='o',
s=35,
zorder=3
)
ax.scatter(
    df_sorted.loc[indices, 'HOME Max'],
    y[indices],
    facecolor=color,
    edgecolor=color,
    marker='o',
    s=35,
    zorder=3
)

# HIC = black, others = grey
plot_group(idx_hic, '0.1', 'HIC')
plot_group(idx_nonhic, '#0072B2', 'LIC/LMIC/UMIC')

ax.invert_yaxis()

ax.set_yticks(y)
ax.set_yticklabels(countries, fontsize=9)
ax.set_xlabel('Deaths at home (%)', fontsize=11)
ax.set_title('Range of Home Deaths by Country', fontsize=13)

ax.grid(False)
for spine in ['top', 'right']:
    ax.spines[spine].set_visible(False)

ax.legend(loc='lower right', frameon=False, fontsize=9)

plt.subplots_adjust(left=0.40, right=0.98, top=0.98, bottom=0.07)
```

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```
# ♦ Save at 300 dpi

fig.savefig('HomeDeaths_forestplot_300dpi.pdf', dpi=300)
fig.savefig('HomeDeaths_forestplot_300dpi.tiff', dpi=300)

plt.show()

# Optional: download
files.download('HomeDeaths_forestplot_300dpi.pdf')
files.download('HomeDeaths_forestplot_300dpi.tiff')
```

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Supplementary File 5. Full spectrum of places of death and harmonised categories.

Home	Hospital or health institution (H/HI)	Long-term care facility or nursing home (LTC/NH)	Palliative care or hospice facility (PC/H)	Other or ill-defined place (O/I)
• Home • Home (excluding deaths in residential aged care or nursing homes)	• Hospital • Hospital or other medical establishment • Health centre • Hospital/clinic • Hospital or health institution	• Nursing home • Care home • Residential aged care facilities (RAC) • Long-term care setting • Long-term health care facility • Institutes for long-term patients • Other institutions such as old age homes • Sheltered housing	• Hospice • Hospice setting • Hospice facility • Palliative care units or hospice • PC institutions • In-patient hospice • Other palliative care institutions	• Other/ Other defined / elsewhere • Other (incl. private homes and public places) • Not home • Not in institution • Other institution • Outside hospital • Ill-defined

Footnote: Ambiguous categories combining multiple settings (i.e., other, incl. private homes and public places) were grouped under O/I to maintain comparability among the remaining categories.

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Supplementary File 6. Characteristics of included studies

Publication, year	NOS score (1-7)	Study/report type	Years covered and countries included	Population (size) and cause of death	Place of death categories as studied	Associated factors analysed
WHO, 1989 ^a [30]	3	Annual world health statistics report, including mortality statistics (primary data)	1989: Australia, Austria, Bahrain, Belgium, Bulgaria, Czechoslovakia, Denmark, England and Wales, Federal Republic of Germany, Finland, France, German Democratic Republic, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxembourg, Malta, Netherlands, New Zealand, Northern Ireland (UK), Norway, Poland, Portugal, Scotland, Singapore, Spain, Sweden, Switzerland, USA, USSR, Yugoslavia	Not reported	Hospital or other medical establishment Other institutions such as old age homes	No factors analysed
Seale, 2000 [32]	3	Review on changing patterns of mortality worldwide (secondary data)	1988, 1996: Canada, France, Italy, Japan, Poland, South Korea, Romania, Spain, Sweden, USA, UK, USSR	Not reported	Hospital	No empirical evidence per country
Tang and McCorkle, 2001 [33]	1	Review on determinants of PoD of terminal cancer patients (secondary data)	1957-1974: USA (Cuyahoga County, Ohio) 1976-1978: USA 1968-1981: USA (Washington State) 1986-1990: Italy (Genoa) 1981,1987-1988, 1990: Australia 1989: UK May 1991-April 1992: UK (Exeter Health District)	Terminal cancer patients (population size not reported)	Home Hospital Hospice Nursing home	No empirical evidence per country
WHO, 2004 [34,45]	2	Booklets on evidence to improve palliative care, including preliminary data on PoD (combination of primary and secondary data)	1985: Switzerland ^b 1999: France 2000: England & Wales (UK), Netherlands Germany ^b Ireland ^b USA ^b	Not reported	Home Hospital Nursing home In-patient hospice	No factors analysed
Decker and Higginson, 2007	6	Study of individual mortality data on factors affecting	1995-1998:UK (London) and USA (New York)	Deceased from cancer, 40 years and older (111,272)	Home Hospitals Nursing home	Cause of death Gender Age

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[31]		place of cancer death (primary data)			In-patient hospice	Ethnicity Socio-economic status (SES) Years Country (City)
Dying Well in Europe 2008-2010 [35,46-51]	7	Study of individual mortality data on Pod, with sub-analyses by age, cause of death and region (primary data)	2002: Italy (Emilia Romagna, Tuscany and Milan) 2003: Belgium (Flanders and Brussels), Denmark, England (UK), Netherlands, Norway, Scotland (UK), Sweden, Wales (UK)	Deceased of all ages and causes (991,629) with analysis for specific causes of death and age groups: cancer, dementia in 65 and older, children (1-17y) with CCC.	Home Hospital Care home Nursing home Hospice Other palliative care institutions Outside hospital Other institution Other / elsewhere	Cause of Death Sex Age Marital status Educational level Country of residence Hospital bed rate Care home bed rate Urbanisation Social support Income
WHO, 2011 ^d [36]	2	Booklet on evidence to improve palliative care for older people, including data on PoD (combination of primary and secondary data)	2002: Italy 2003: Netherlands and Belgium 2005: Portugal 2008: Czech Republic (Czechia), Norway, England and Wales (UK)	Not reported	Home Not home	No factors analysed
Broad et al., 2013 ^d [37]	6	International comparison of published and available statistics on deaths in hospital and residential aged care settings (combination of primary and secondary data)	2000-2004: Japan (Kyushu) 2000-2010: Ireland 2001: Wales 2001-2007: Switzerland 2001-2007: Malta 2002: Canada (Ontario), Sweden 2003: Belgium, Netherlands, Scotland (UK), Wales (UK), USA 2003-2009: Slovenia 2004: Canada 2004-2005: China 2005: Australia, South Africa 2005-2006: Botswana 2005-2007: Belgium, England 2006: Canada, Singapore	Deceased of all ages and causes (16,200,000)	Hospitals Residential aged care facilities Other (including private homes and public places)	Age Gender

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			2006-2009: Serbia 2007-2009: Chile, Cyprus, Iceland, Japan 2008: Taiwan, Portugal, England and Wales (UK) 2008-2010: Estonia 2009: Albania, Brazil, Croatia, Czechia, South Korea, 2009-2010: Austria 2010: Norway, Lithuania 2010-2011: Sri Lanka			
Loucka et al., 2014 ^e [39]	7	Study of individual mortality data on factors influencing PoD and the likelihood of dying at home (primary data)	2011: Czechia and Slovakia	Deceased of all ages and causes (154,288)	Home Hospital Long term health care facility Institutes for long term patients Other	Cause of death Age Gender Education Marital status
IPoD, 2014-2018 ^e [16,38,52-58]	7	Study of individual mortality data on PoD, with sub-analyses by age and cause of death (primary data)	2007: USA 2008: France, Italy, Belgium, Netherlands, Czech Republic, Hungary, England (UK), Wales (UK), New Zealand, Canada, (excluding Quebec), Mexico, South Korea 2010: Spain (Andalusia)	Deceased of all ages and causes (5,570,065) with sub-analysis for specific populations: deceased from cancer, dementia, Parkinson's, HIV, suicide, illnesses indicative of PC, children 1-17 years old with CCC.	Home Hospital Nursing home Care home Long-term care setting PC institutions Hospice setting Hospice facility Others	Country Cause of death Sex Age Marital status Educational attainment Urbanisation LTC bed rate Hospital bed rate GP's availability
Forma et al., 2020 ^e [40]	7	Study of individual mortality data on PoD among older people (primary data)	2011: Finland and Norway	Deceased from all causes, 70 years and above (68,433)	Hospital Health centre Nursing home Sheltered housing Not in institution	End of life trajectory Age Sex Urbanisation
Wolff et al., 2020 ^d [42]	7	Systematic review with meta-analysis on predictors for place of death among children (secondary data)	1987-2008, 2011: Portugal 1999-2006: England (UK) 1999-2011, 2000-2011: USA 2000-2012: Canada 2001-2010: Taiwan 2002: Italy	Deceased children and young people (upper age limit of 24 years) from multiple causes (106,788)	Home Hospital Other	Cause of death Gender Ethnicity Socio-economic position

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			2003: Belgium, Netherlands, Norway, England, Wales 2002-2004: México 2004-2014: England and Wales (UK) 2005-2014: England (UK) 2007: USA 2008: Belgium, Canada, Czech Republic, France, Italy, Mexico, New Zealand, South Korea, Spain, Sweden, England (UK)			
Adair, 2021 ^d [13]	6	International comparison of published and available statistics modelling home death percentages (combination of primary and secondary data)	2005: France 2005: Malta, New Zealand 2005-2007: Belgium 2006, 2008: England (UK) 2007-2011: Tunisia 2008: Cyprus, Japan 2008, 2013-2016: Chile 2009: Czechia, Estonia, South Korea 2010: Austria, Norway 2010-2014: Sri Lanka 2011: Mozambique ^b , Papua New Guinea ^b 2012-2016: Ireland, South Africa 2013: Malaysia 2013-2017: Croatia, Ecuador, Guatemala, Iran, Kuwait, Latvia, Mexico, Panama ^b Thailand 2014-2018: Brazil, China, Colombia, Cuba, Paraguay, Philippines, Trinidad and Tobago, Uruguay 2015: Nepal ^b 2015-2017: Nicaragua 2015-2018: Costa Rica 2015-2019: Egypt 2016: El Salvador 2016-2018: Singapore 2017: Argentina 2018: Botswana 2018-2019: Peru 2019: Iraq, Mongolia, Australia	Deceased of all ages and causes (55,700,544)	Home (excluding deaths in residential aged care or nursing homes)	Age Cause of death Home birth delivery Urbanisation (% people living in urban areas) Health expenditure per capita GBD's UHC effective coverage GBD's SDI UN's HDI - education and income indexes and their geometric mean Wold Region
Jiang and May, 2021 ^e	6	Study of trends of deaths in hospital and	2005-2017: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland,	Deceased of all ages and	Hospital	Number of hospital beds Mean length of hospital stay

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[3,59]		associations using aggregate PoD data and panel data (primary data)	France, Germany, Greece ^c , Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein ^c , Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK	causes (43,956,743)		People receiving home care Palliative care services availability Unmet needs due to financial reasons Ambulatory care expenditure LTC covered by government Avoidable death Social support Lack of personal care provision European Region Year
Seitz et al., 2022 ^c [15,60]	7	Study of individual mortality data on PoD and associated factors (primary data)	2016: Chile, Costa Rica 2017: Argentina, Brazil, Colombia, Ecuador, El Salvador, Guatemala, Mexico, Paraguay, Peru 2018: Uruguay	Deceased from all causes, aged 1 year and older (2,994,685)	Home Hospital Other	Cause of death Age Sex Education level Hospital beds per 10,000 pop. Medical doctors per 10,000 pop. Nursing personnel per 10,000 pop. Palliative care services in primary care per million pop. Urbanisation (area of residence) Marital Status Gross National Income (GNI) per capita Healthcare expenditure per capita Country
Wilson et al., 2022 [43]	2	Scoping review on hospital death rates in developed countries (secondary data)	2001-2020: Australia, Austria, Belgium, Canada, Denmark, England, Finland, Germany, Iceland, Japan, Netherlands, Northern Ireland (UK), Norway, Republic of Ireland, Scotland (UK), Singapore, Spain, Sweden, Switzerland, USA, Wales (UK)	Deceased from all ages and causes (14,264,249)	Hospital	No factors analysed
Durán et al., 2023 ^c [41]	6	Interrupted time series study on PoD of cancer patients exploring the effects of the Covid-19 pandemic (primary data)	July 2019 to July 2021: Brazil, Chile and Peru	Deceased from all ages and causes (3,753,804)	Home Hospital/clinic Other	Cause of death Age Sex Covid-19 pandemic restrictions Year

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OECD, 2023 ^d [44]	2	Annual health indicators report, including data on hospital deaths of published and available statistics (combination of primary and secondary data)	2011, 2021 or nearest year pre-pandemic: Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, UK, USA	Not reported	Hospital	No factors analysed
Lopes et al., 2024 ^e [14]	7	Study of aggregate mortality data on PoD examining trends and differences by age, gender and cause of death (primary data)	2011-2021: Austria, Belgium, Brazil, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Mexico, Netherlands, Poland, Portugal, South Korea, Romania, Slovakia, Slovenia, Spain, Sweden, Uganda, England and Wales (UK), Northern Ireland, Scotland, USA	Deceased from all causes, aged 18 years and older (100,733,693)	Home, Hospital or health institution Other defined Ill-defined	Cause of death Age Sex Year

Abbreviations: CCC, Chronic complex condition; GBD – Global Burden of Disease; HDI – Human Development Index; HIV – Human immunodeficiency virus; LTC – Long-term care; PC – Palliative care; UHC – Universal Health Coverage; SDI – Socio-Demographic Index (SDI); UK – United Kingdom; UN – United Nations; USA – United States of America.

Footnotes: a. Although other WHO Annual World Health Statistics volumes report multi-country death certificate-based place of death data, only the 1989 volume was included for feasibility. b. Countries for which place of death data were either not death certificate-based or could not be established as death certificate-based due to insufficient information, and hence were excluded from our synthesis. c. Countries excluded from the synthesis due to unreported data. d. Five studies/reports using secondary sources of place of death data that were also represented in other studies/reports independently represented in this review (n=4). WHO, 2011 included evidence from Dying Well in Europe 2008-2010; Wolff et al., 2020 included paediatric analyses from Dying Well in Europe 2008-2010 and IPoD, 2014-2018; Broad et al., 2013 included data from Dying Well in Europe 2008-2010; Adair, 2021 included estimates reported by Broad et al., 2013; and OECD, 2023 included data provided through EOLinPLACE (Lopes et al., 2024). e. Seven studies using exclusively primary sources of PoD data had country-year data that overlapped, totally or partially, with those of other studies also using exclusively primary sources of PoD data, comprising six overlapping study pairs: Durán et al., 2023 and Lopes et al., 2024; Forma et al., 2020 and Jiang and May, 2021; IPoD, 2014–2018 and Jiang and May, 2021; Jiang and May, 2021 and Lopes et al., 2024; Jiang and May, 2021 and Loucka et al., 2014; and Lopes et al., 2024 and Seitz et al., 2022. Supplementary File 7 presents the complete

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pairwise country-year overlap matrix across all studies/reports, including overlaps involving studies/reports using primary, secondary, or a combination of primary and secondary sources of place of death data.

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Supplementary File 7a. Corrected Covered Area calculation according to Pieper et al.; 2014²

Metric	Value
Nr (total country-year data sets)	1159
Np (unique country-year datasets)	835
Ns (all studies)	19

$$CCA = \frac{Nr - Np}{(Np \times Ns) - Np}$$

$$CCA = \frac{1159 - 835}{(835 \times 19) - 835} = \frac{324}{15865 - 835} = \frac{324}{15030} = 0.021556 (2.2\%)$$

²²Pieper, D., Antoine, S.L., Mathes, T., et al., 2014. Systematic review finds overlapping reviews were not mentioned in every other overview. J. Clin. Epidemiol. 67 (4), 368–375.
<https://doi.org/10.1016/j.jclinepi.2013.11.007>.

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342	Total nodes (pairs of studies)
292	Slight overlap (<5%)
12	Moderate overlap (5% to <10%)
5	High overlap (10% to <15%)
33	Very High overlap (≥15%)

Studies/reports are labelled according to their PoD data sources as P (primary sources only), S (secondary sources only), or P+C (combination of primary and secondary sources).

		Adair 2021	Broad et al. 2013	Decker & Higginson 2007	Duran et al. 2023	Dying well in Europe 2008-2010	Forma et al. 2020	IPoD 2014-2018	Jiang and May 2021	Lopes et al. 2024	Loucka et al. 2014	OECD 2023	Seale 2000	Seitz et al. 2022	Tang & McCorkle. 2001	WHO 1989	WHO 2004	WHO 2011	Wilson et al. 2022	Wolff et al. 2020
Adair 2021 (P+C)	(np=133)		2%	0%	1%	0%	0%	0%	12%	16%	0%	0%	0%	8%	0%	0%	0%	0%	1%	0%
Broad et al. 2013 (P+C)	(np= 94)	2%		0%	0%	4%	0%	1%	33%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	15%
Decker & Higginson 2007 (P)	(np=8)	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%
Duran et al. 2023 (P)	(np=9)	11%	0%	0%		0%	0%	0%	0%	33%	0%	11%	0%	0%	0%	0%	67%	0%	0%	0%
Dying well in Europe 2008-2010 (P)	(n=6)	0%	67%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	17%
Forma et al. 2020 (P)	(np=2)	0%	0%	0%	0%	0%		0%	100%	0%	0%	50%	0%	0%	0%	0%	0%	0%	50%	0%
IPoD 2014-2018 (P)	(np=13)	0%	8%	0%	0%	0%	0%		46%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	23%
Jiang and May 2021 (P)	(np=318)	5%	10%	0%	0%	0%	1%	2%		40%	1%	6%	0%	0%	0%	0%	0%	1%	3%	7%
Lopes et al. 2024 (P)	(np=293)	7%	0%	0%	1%	0%	0%	0%	44%		0%	7%	0%	1%	0%	0%	0%	0%	4%	4%
Loucka, 2014 (P)	(np=2)	0%	0%	0%	0%	0%	0%	0%	100%	0%		100%	0%	0%	0%	0%	0%	0%	0%	0%
OECD 2023 (P+C)	(np=60)	0%	0%	0%	2%	0%	2%	0%	32%	33%	3%		0%	0%	0%	0%	0%	0%	3%	7%
Seale 2000 (S)	(np=11)	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%
Seitz et al. 2022 (P)	(np=12)	83%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%		0%	0%	0%	0%	0%	0%
Tang & McCorkle. 2001 (S)	(np=37)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		5%	0%	0%	0%	0%
WHO 1989 (P)	(np=30)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%		0%	0%	0%	0%	3%

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WHO 2004 (P+C)	(np=3)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%
WHO 2011 (P+C)	(np=7)	0%	43%	0%	0%	43%	0%	29%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%
Wilson et al. 2022 (S)	(np=31)	3%	0%	0%	0%	0%	3%	0%	29%	39%	0%	6%	0%	0%	0%	0%	0%	0%	0%	3%
Wolff et al. 2020 (S)	(np=90)	0%	16%	0%	0%	1%	0%	3%	26%	14%	0%	4%	0%	0%	0%	0%	1%	1%	2%	1%

Supplementary File 8. Place of death distribution by country: minimum – maximum range values.

Country year range (data years)	Income group (UN region)	Percentage of deaths							
		Home		H/HI		LTC/NH		PC or hospice	
		min (year; population)	max (year; population)	min (year; population)	max (year; population)	min (year; population)	max (year; population)	min (year; population)	max (year; population)
Albania 2009 (1 year)	UMIC (EUR)	-		11% (2009)		-		-	
Argentina 2017 (1 year)	UMIC (AMR)	22.6% (2017)		69.5% (2017)		-		-	
Australia 1981 – 2019 (7 years)	HIC (OCE)	13.8% (1987)	19% (1988)	53.5% (2019)	75% (2019; New South Wales)	5% (1988; terminal cancer patients)	32% (2005; +65y)	5% (1981; terminal cancer patients)	20% (1990; terminal cancer patients)
Austria 1989 – 2021 (18 years)	HIC (EUR)	25.7% (2019)	33% (2010)	47.6% (2020)	60% (1989)	15% (2009-10)	18% (2009-10; +65y)	-	

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Bahrain 1989 (1 year)	HIC (ASI)	-		67% (1989)		-		-
Belgium 1989 – 2021 (17 years)	HIC (EUR)	21.7% (2003; Flanders and Brussels; non-cancer)	42% (2008; CCC; 1-17y)	45% (2021)	61.4% (2003; Flanders and Brussels; cancer)	10.5% (2003; Flanders and Brussels; cancer)	26.9% (2003; Flanders and Brussels; non cancer)	-
Botswana 2005 – 2018 (3 years)	UMIC (AFR)	47.9% (2018)		64% (2005-06)		-		-
Brazil 2009 – 2021 (11 years)	UMIC (AMR)	18.8% (2021)	21.4% (2020)	65.9% (2017)	75.3% (2019-2021)	-		-
Bulgaria 1989 – 2021 (18 years)	UMIC (EUR)	51.7% (2021)	67.1% (2012)	25% (1989)	30.5% (2012-21)	-		-
Canada 1996 – 2021 (17 years)	HIC (AMR)	14.9% (2008)		43% (2000- 12; cancer, 0-18y)	73% (1996)	10% (2004)	32% (2006; Manitoba; +65)	-
Chile 2016 – 2021 (9 years)	HIC (AMR)	47.4% (2019-2021)	49.7% (2016)	40% (2016)	47% (2007-09)	-		-
China 2014 – 2018 (5 years)	UMIC (ASI)	72.1% (2014)	73.9% (2017)	19% (2004-05)		-		-
Colombia 2014 – 2018 (5 years)	UMIC (AMR)	25% (2016, 2018)	26.5% (2017)	64.7% (2017)		-		-
Costa Rica 2015 – 2018 (4 years)	UMIC (AMR)	35.6% (2015)	37.1% (2016, 2018)	53.7% 2016		-		-
Croatia	HIC	28.3%	35.7%	47%	50.2%	10%	12%	

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2009 – 2021 (12 years)	(EUR)	(2019)	(2014)	(2009)	(2012-21)	(2009)	(2009; +65y)	-
Cuba 2014 – 2018 (5 years)	UMIC (AMR)	39.9% (2017, 2018)	41.2% (2015)	-		-		-
Cyprus 2007 – 2021 (15 years)	HIC (EUR)	14.4% (2012)	24.1% (2020)	43% (2007-09)	59.6% (2012-21)	12% (2007–09)	15% 2007–09 (+65)	-
Czechia 2007 – 2021 (15 years)	HIC (EUR)	17% (2008; CCC; 1-17y)	23.5% (2020, 2021)	57.4% (2008)	77% (2008; CCC; 1- 17y)	12.2% (2011)	17,7% (2008)	-
Denmark 1989 – 2021 (17 years)	HIC (EUR)	18.3% (2012)	27.5% (2021)	40% (2021)	56% (1989, 2011)	-		-
Ecuador 2013 – 2017 (5 years)	UMIC (AMR)	46.9% (2017)	48.9% (2017)	42.9% (2017)		-		-
Egypt 2015 – 2019 (5 years)	LMC (AFR)	65.8% (2019)	72.6% (2015)	-		-		-
El Salvador 2016 – 2017 (2 years)	UMIC (AMR)	48.2% (2016)	50.7% (2017)	35.4% (2017)		-		-
Estonia 2005 – 2021 (17 years)	HIC (EUR)	27.3% (2019)	34.4% (2012)	54% (2008-10)	58.9% (2012-21)	11% (2008-10)		-
Finland 2005 – 2021 (17 years)	HIC (EUR)	16.7% (2021)	19.3% (2012)	54% (2021)	75% (1989)	19% (2011)		-
France 1989 – 2021	HIC	20.7% (2016)	27%	50%	61.6%	10%	14.5%	

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(18 years)	(EUR)		(1999)	(1989, 1996)	(1999)	(2005-06)	(1999)	-
Germany 2001 – 2021 (16 years)	HIC (EUR)	-		45.6% (2019)	57.6% (2001)	-		-
Greece 1989 – 2021 (12 years)	HIC (EUR)	41.6% (2021)	44.4% (2020)	46% (1989)	51% (2021)	-		-
Guatemala 2013 – 2017 (5 years)	UMIC (AMR)	63.9% (2014, 2015)	67.9% (2017)	22.3% (2017)		-		-
Hungary 1989 – 2021 (15 years)	HIC (EUR)	-		55% (1989)	67% (2021)	-		-
Iceland 1989 – 2021 (16 years)	HIC (EUR)	-		46.4% (2020)	80% (1989)	32% (2007–09)	38 % (2007–09;+65)	-
Iran 2013 – 2019 (7 years)	UMIC (ASI)	36.6% (2017)	40.8% (2013)	-		-		-
Iraq 2019 (1 year)	UMIC (ASI)	48.2% (2019)		-		-		-
Ireland 1989 – 2021 (20 years)	HIC (EUR)	25.3% (2012-2016)		40% (2011-2017)	62% (1989)	12% (2000–10)	14% (2000–10) (+65)	-
Israel 1989 – 2021 (2 years)	HIC (EUR)	-		57% (2021)	68% (1989)	-		-
Italy 1986 – 2021 (25 years)	HIC (EUR)	30.7% (1986-1990)	41.8% (2008)	37% (1996)	69.3% (1986-90; Genoa; terminal	6.4% (2008)		-

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					cancer patients)				
Japan 1996 – 2021 (12 years)	HIC (ASI)	-		67% (1996)	81% (2011)	4% (2007–09)	12% (2000-04; Kyushu; +65)	-	
Kuwait 1989 – 2017 (2 years)	HIC (ASI)	23.3% (2013-2017)		72% (1989)		-		-	
Latvia 2008 – 2021 (14 years)	HIC (EUR)	39.7% (2019)	46.1% (2012)	41% (2008-2017, 2011)	48% (2021)	-		-	
Lithuania 2010 – 2021 (12 years)	HIC (EUR)	29.7% (2019)	37.7% (2012)	50% (2010)	62% (2021)	-		-	
Luxembourg 1989 – 2021 (18 years)	HIC (EUR)	16.9% (2017)	19% (2021)	55.1% (2012-21)	69% (1989)	-		-	
Malaysia 2013 (1 year)	UMIC (ASI)	48% (2013)		-		-		-	
Malta 1989 – 2021 (22 years)	HIC (EUR)	11% (2016)	16.7% (2020)	66% (2001-10) (+65y)	68.5% (2012-21)	13% (2001-10)	16% (2001-10; +65)	-	
Mexico 2002 – 2021 (15 years)	UMIC (AMR)	15% (2002-2004; cancer; 0-18y)	48.4% (2021)	42% 2021	85% (2002-2004; cancer; 0-18y)	-		-	
Mongolia 2019 (1 year)	UMIC (ASI)	60.9% (2019)		-		-		-	
Netherlands 1989 – 2021 (19 years)	HIC (EUR)	21.3% (2003; non cancer)	45.4% (2003; cancer)	23% (2021)	46% (1989)	19.2% (2003; cancer)	39.3% (2003; non- cancer)	1.6% (2003; non- cancer)	3.8% (2003; cancer)

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New Zealand 2003 – 2021 (8 years)	HIC (OCE)	22.2% (2008)		32% (2021)	37% (2011)	31% (2003-07)	38% (2003–07; +65y)	6.3% (2008)
Nicaragua 2015 – 2017 (3 years)	LMC (AMR)	50.1% (2015)	50.6% (2016)	-		-		-
Norway 1989 – 2021 (16 years)	HIC (EUR)	12.7% (2003; cancer)	21% (2010)	27% (2021)	86.9% (2003; cancer)	11% (1989)	57.3% (2011; +70y)	-
Paraguay 2014 – 2019 (7 years)	UMIC (AMR)	29.2% (2018)	31.4% (2014)	58.6% 2017		-		-
Peru 2017 – 2021 (4 years)	UMIC (AMR)	36.2% (2019)	43% (2017)	48.9% (2017)	55.3% (2019-21)	-		-
Philippines 2014 – 2018 (5 years)	LMC (ASI)	53.2% (2018)	61.1% (2014)	-		-		-
Poland 1989 – 2021 (19 years)	HIC (EUR)	35.2% (2018)	39.4% (2020)	47% (1996)	59% (2021)	-		-
Portugal 1987 – 2021 (41 years)	HIC (EUR)	19% (1987–2011; non-traumatic; 0-17y)	28.1% (2012)	39% 1989	79% (1987-2011; (non-traumatic; 0-17y)	-		-
Romania 1996 – 2021 (18 years)	HIC (EUR)	51.8% (2021)	66.3% (2012)	18% (1996)	35% (2021)	-		-
Serbia 2006–09 (4 years)	UMIC (EUR)	-		39% (2006-09)		-		-

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Singapore 2006 – 2019 (3 years)	HIC (ASI)	23.9% (2018)		57% (2006) (+65)	62.2% (2019)	7% (2006) (+65y)		-
Slovakia 2011 – 2021 (11 years)	HIC (EUR)	26.9% (2019)	30.4% (2013)	53% (2011-17)	60% (1989)	3% (2011)		-
Slovenia 2005 – 2021 (18 years)	HIC (EUR)	42% (2012)	48% (2020)	51% (2021)	55% (2005-2017)	-		-
South Africa 2005 – 2016 (6 years)	UMIC (AFR)	28.5% (2015)	32.8% (2012)	46% (2005)		2% 2005		-
South Korea 1996 – 2021 (13 years)	HIC (ASI)	13.8% (2019)	22.9% (2008)	23% (1996)	74% (2012-2012)	1.6% (2008)	3% (2009; +65)	-
Spain 1989 – 2021 (15 years)	HIC (EUR)	25.1% (2015)	33.8% (Andalusia; 2010)	30% (1996)	61% (2009)	7.9% (2010; Andalusia)		-
Sri Lanka 2010 – 2014 (5 years)	LMC (ASI)	43.9% (2014)	46.7% (2010)	-		-		-
Sweden 1989 – 2021 (25 years)	HIC (EUR)	16.3% (2012)	21.2% (2021)	37% (2020)	79% (1996)	-		-
Switzerland 1989 – 2021 (14 years)	HIC (EUR)	-		30% (2011)	54% (1989)	34% (2001; German)		-
Taiwan 2001 – 2010 (10 years)	HIC (ASI)	-		42% (2008)	87% (2001-10; cancer, 0-18y)	-		-
Thailand	UMIC	49.4%	50.4%	-		-		-

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2013 – 2017 (5 years)	(ASI)	(2016)	2013						
Trinidad and Tobago 2014 – 2018 (5 years)	HIC (AMR)	28.4 % (2015)	29.8% (2018)	-	-	-	-	-	-
Tunisia 2007 – 2011 (5 years)	LMC (AFR)	55.9% (2009)	58.9% (2007)	-	-	-	-	-	-
Uganda 2012 – 2021 (10 years)	LIC (AFR)	43.4% (2021)	83.3% (2012)	34.9% (2012-21)	-	-	-	-	-
United Kingdom – (1989 –2021) (28 years) includes England. Wales. Scotland and Northern Ireland.	HIC (EUR)	16.6% (2003; England; non- cancer)	45% (1999-2006; England; cancer, 0-19y)	40% (2021)	74% (2004–2014 England & Wales; 0-18y)	5.5% (1995-1998; London, cancer; +40)	21% (2008; England and Wales; +65y)	0.2% (2003; Wales; non- cancer)	18.5% (1995-1998; London; cancer +40)
United States of America 1957-2021 (53 years)	HIC (AMR)	16% (Washington state) (1968-1981)	38% (1999- 2011; 0-19y)	28.5% (2019)	69,6% (1976-78; terminal cancer patients)	6,3% (1995-1998; New-York; cancer +40)	29% (2005; +65y)	2.7% (2007)	
Uruguay 2014 – 2018 (5 years)	HIC (AMR)	39.1% (2018)	41% (2014-2018)	53.6% (2018)	-	-	-	-	-

Footnote: Data were extracted from the most comprehensive population sample available per study. Restricted sub-analyses (e.g., children only) were excluded when a broader population dataset from the same study was available. Percentages refer to whole-population data unless otherwise specified and when the original studies reported a specific population (e.g. region, age group, and/or cause of death). No. of years corresponds to the number of unique calendar years represented across all studies. Countries are classified according to World Bank classification by income level (World Bank, 2024) and United Nations geoscheme regions. (United Nations Statistics Division, 2021) AFR = Africa; AMR = Americas; ASI = Asia; CCC=Chronic complex

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conditions; EUR = Europe; H/HI =Hospital or health institution; HIC = High-income country; LIC = Low-income country; LMC = Lower-middle-income country; LTC/NH=Long-term care or nursing home; OCE = Oceania; PC/H=Palliative care or hospice facility; UMIC = Upper-middle-income country.

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