Declining mortality and multi-morbidity at death

IUSSP Panel kick-off webinar
Thursday 30 March

Steering committee:
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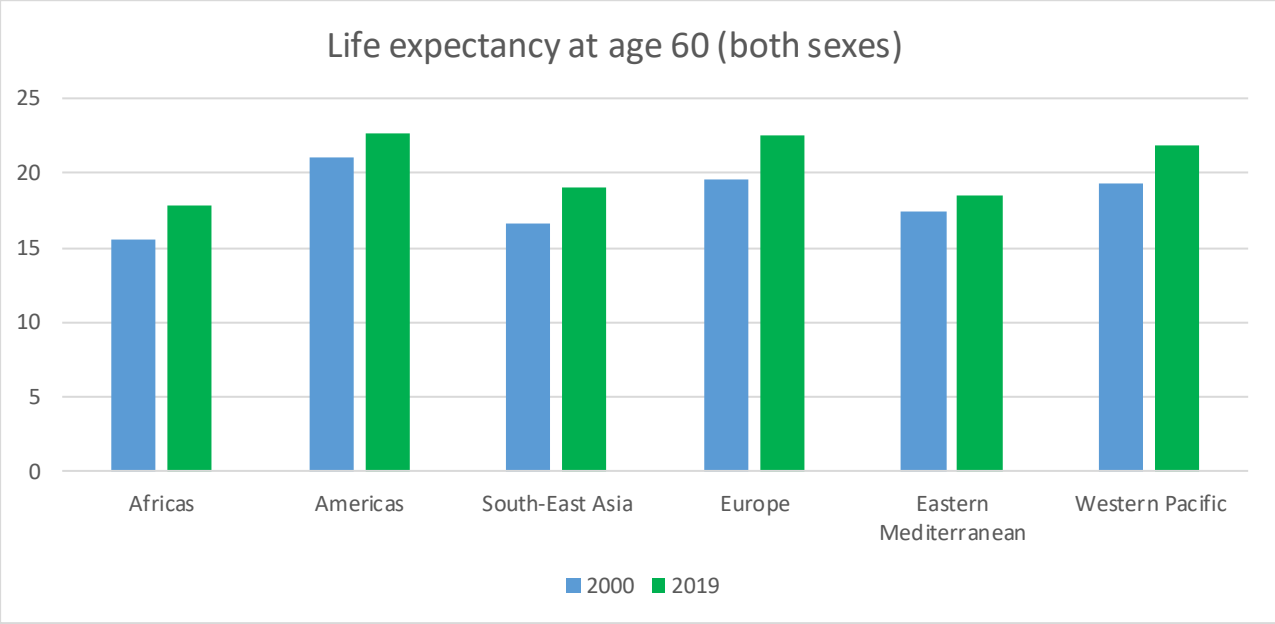
Why a panel on multi-morbidity and mortality decline?

All over the planet: increase in life expectancy at age 60…



Data: WHO

… which is strongly related with better survival to chronic conditions.

Why a panel on multi-morbidity and mortality decline?

Other side of the coin: (potential) increase in the prevalence of multi-morbidity (usually defined as the co-occurrence of two or more chronic conditions)

According to a recent meta-analysis (Nguyen et al., Journal of comorbidity, 2019): the overall pooled (non-standardized) prevalence of multi-morbidity was 42% (41% in HICs and 44% in LMICs).

Quite rich literature on the topic:

- Multi-morbidity is related with age (but it is not only a matter of old age)
- It is more frequent among females and among lower education levels and socioeconomic statuses
- Impact in terms of health outcomes : worse self-rated health, higher risk of disability and mortality

Why a panel on multi-morbidity and mortality decline?

Multi-morbidity is a key of component of epidemiologic profiles, and it is likely to strongly contribute to mortality processes.

As such, it is necessary to:

- describe the patterns of multi-morbidity at death: which associations of causes are especially frequent? How does multi-morbidity contribute to death processes ? Does it increase which age? Is it more frequent among females? Is there a social gradient? etc
- examine trends: increase in the prevalence at death over time?
- examine how these trends are related to mortality trends: is mortality decrease associated with increasing prevalence of multi-morbidity at death?

Outline of our presentation

Which data ? (Viviana Egidi)

What for ? (Sergi Trias-Llimós)

Three examples:

- Overweight and obesity (Tim Adair)
- Infectious and parasitic diseases (Aline Désesquelles)
- Covid-19 (Ana Maria Nogales Vasconcelos)

Activities of the panel (Aline Désesquelles)

The data

- The death certificate is the data source generating all cause-of-death statistics, both underlying and multiple
- The filling in of the death certificate and the coding of the causes are defined by WHO rules
- In recent decades, many countries have adopted automatic coding systems, which improve the quality and comparability of the cause-of-death statistics and make the multiple cause of death statistics more widely available

The certification

- Certification of causes of death by the physician is the first step in the process of producing information on causes of death
- The way the certifying physician reports the causes on the death certificate depends on several factors:

  → the correct diagnosis of the death process and the diseases that contributed to it: it relies on the state of medical knowledge. The positive role of the diagnostic progress

  → the physician's willingness to describe the morbid process as required by WHO rules, which is partly related to the extent to which (s)he has been trained for this specific task

  → the certification style that may vary from one physician to the other, but that may also depend on the characteristics of the dead person or the type of morbid process (e.g., very old age or highly lethal underlying cause)

  → the format of the death certificate

The WHO death certificate

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I		
Disease or condition directly leading to death*	(a)	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d)	.....
II		
Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

**This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.*

PART I: process leading to death

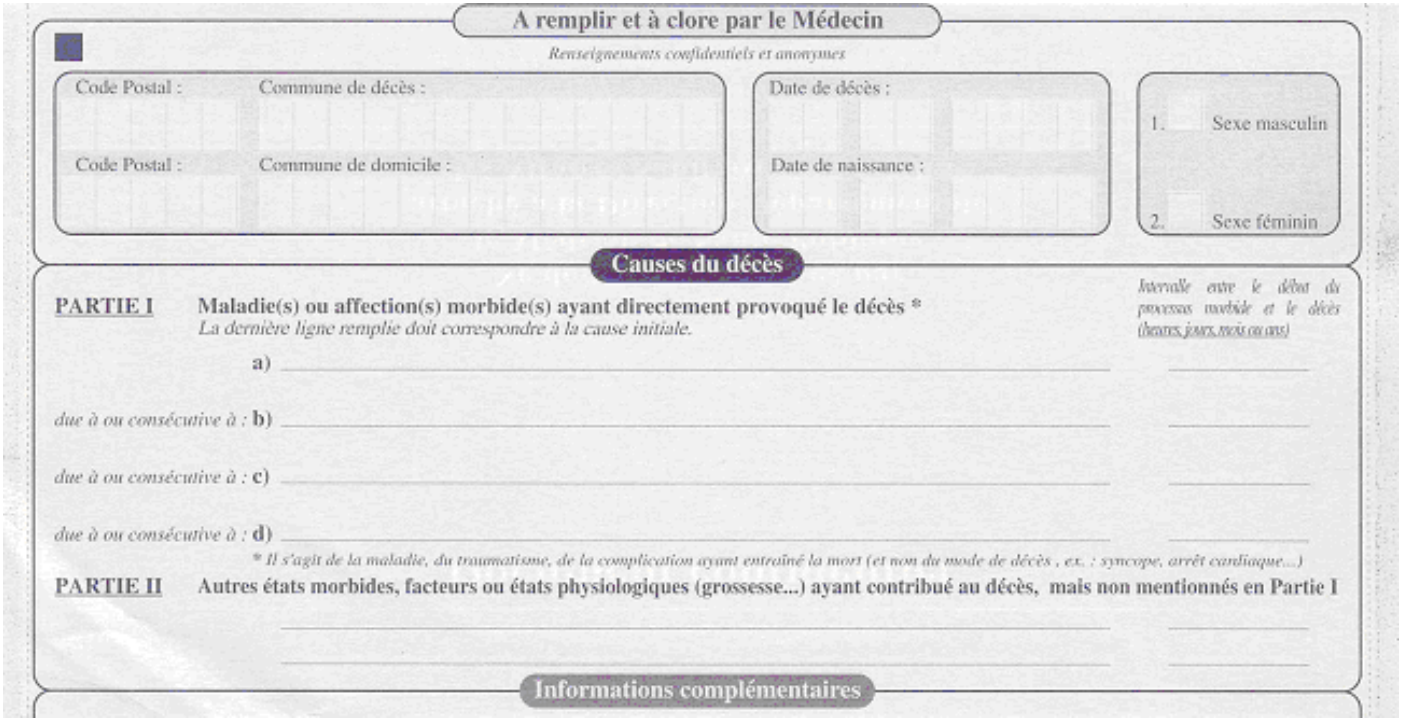
Underlying cause

PART II: Any condition contributing to the death but not involved in the process described in part I

Multiple causes = all causes reported on the death certificates, whether underlying or contributing, whether in Part I or II

A few examples of the adaptation of the WHO certificate in different countries

FRANCE



A remplir et à clore par le Médecin

Renseignements confidentiels et anonymes

Code Postal : Commune de décès :

Code Postal : Commune de domicile :

Date de décès :

Date de naissance :

1. Sexe masculin

2. Sexe féminin

Causes du décès

PARTIE I Maladie(s) ou affection(s) morbide(s) ayant directement provoqué le décès *
La dernière ligne remplie doit correspondre à la cause initiale.

Intervalle entre le début du processus morbide et le décès (heures, jours, mois ou ans)

a) _____

due à ou consécutive à : b) _____

due à ou consécutive à : c) _____

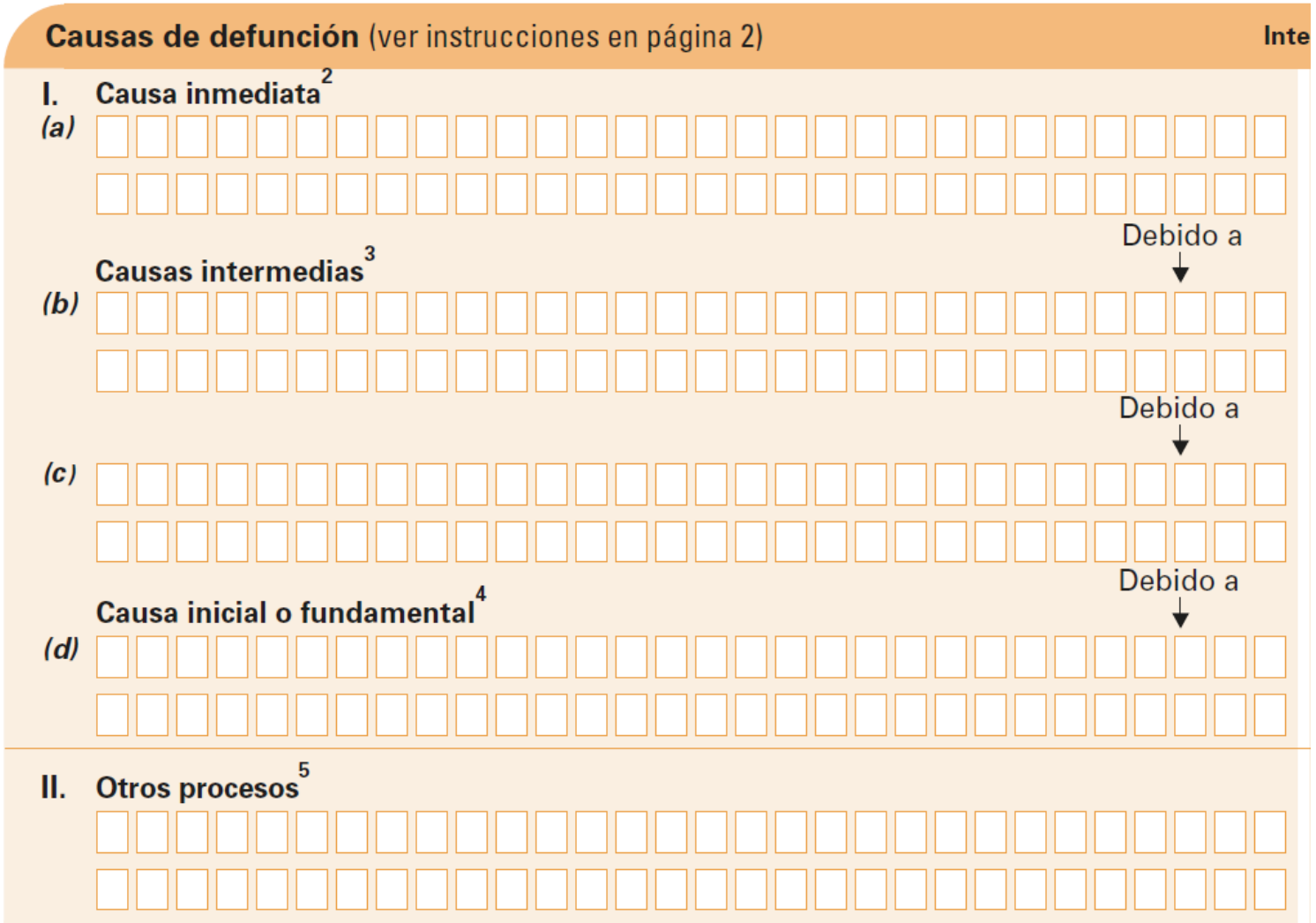
due à ou consécutive à : d) _____

* *Il s'agit de la maladie, du traumatisme, de la complication ayant entraîné la mort (et non du mode de décès , ex. : syncope, arrêt cardiaque...)*

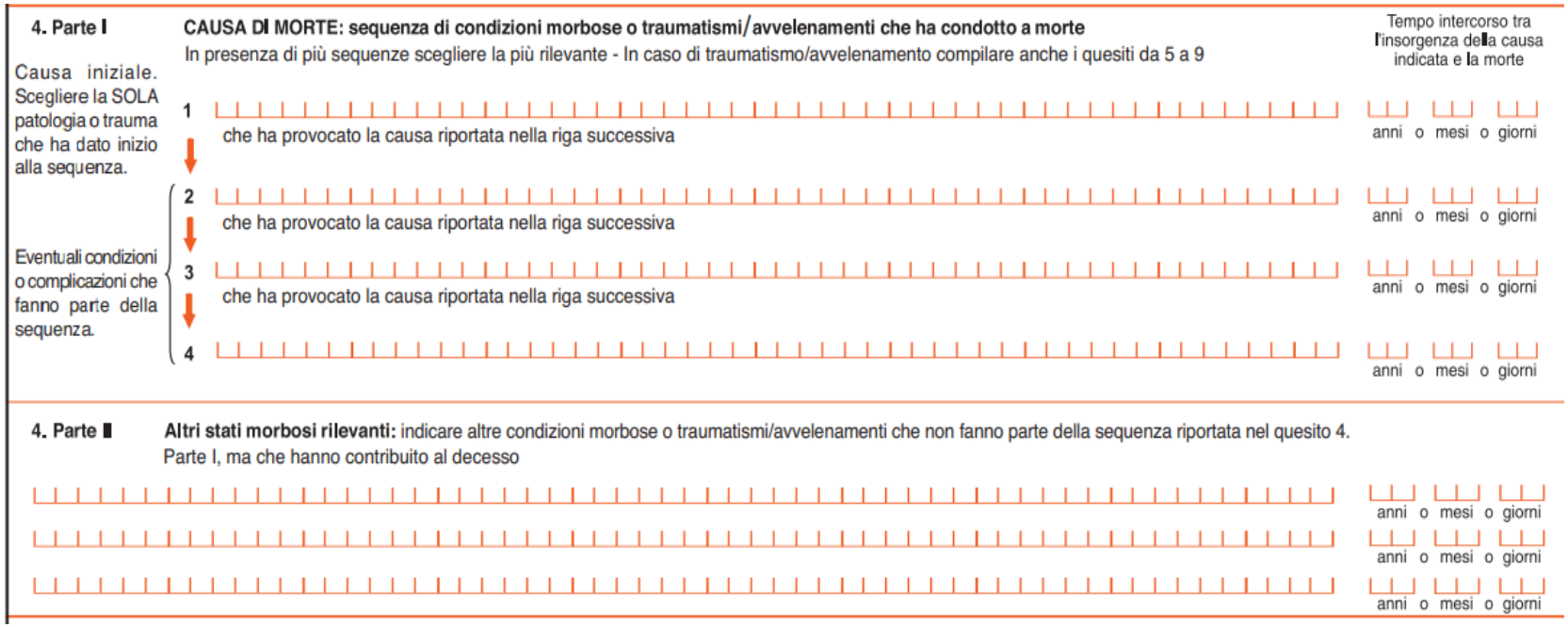
PARTIE II Autres états morbides, facteurs ou états physiologiques (grossesse...) ayant contribué au décès, mais non mentionnés en Partie I

Informations complémentaires

SPAIN


Causas de defunción (ver instrucciones en página 2)
Inte
I. Causa inmediata[2]
(a)
Debido a
Causas intermedias[3]
(b)
Debido a
(c)
Debido a
Causa inicial o fundamental[4]
(d)
II. Otros procesos[5]

ITALY



4. Parte I

CAUSA DI MORTE: sequenza di condizioni morbose o traumatismi/avvelenamenti che ha condotto a morte

In presenza di più sequenze scegliere la più rilevante - In caso di traumatismo/avvelenamento compilare anche i quesiti da 5 a 9

Tempo intercorso tra l'insorgenza della causa indicata e la morte

Causa iniziale. Scegliere la SOLA patologia o trauma che ha dato inizio alla sequenza.

1 che ha provocato la causa riportata nella riga successiva — anni o mesi o giorni

Eventuali condizioni o complicazioni che fanno parte della sequenza.

2 che ha provocato la causa riportata nella riga successiva — anni o mesi o giorni

3 che ha provocato la causa riportata nella riga successiva — anni o mesi o giorni

4 — anni o mesi o giorni

4. Parte II

Altri stati morbosi rilevanti: indicare altre condizioni morbose o traumatismi/avvelenamenti che non fanno parte della sequenza riportata nel quesito 4. Parte I, ma che hanno contribuito al decesso

anni o mesi o giorni

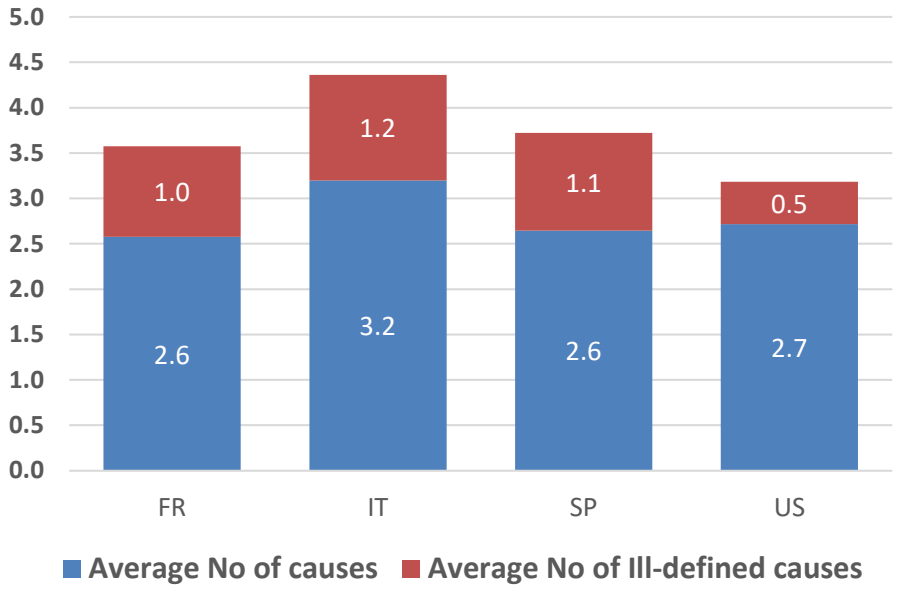
anni o mesi o giorni

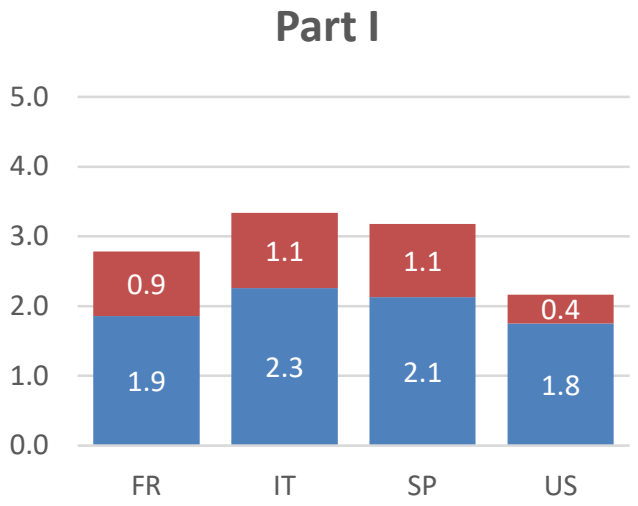
anni o mesi o giorni

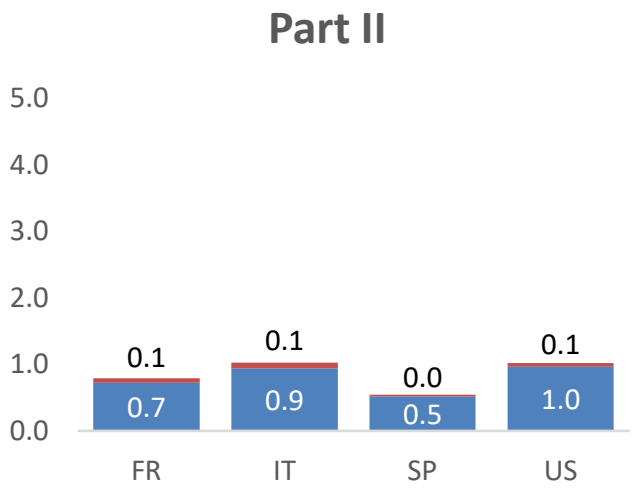
An opposite order of the sequence in Part I

Overall: certificate formats are very similar with a few differences to keep in mind when analysing the results and making comparisons

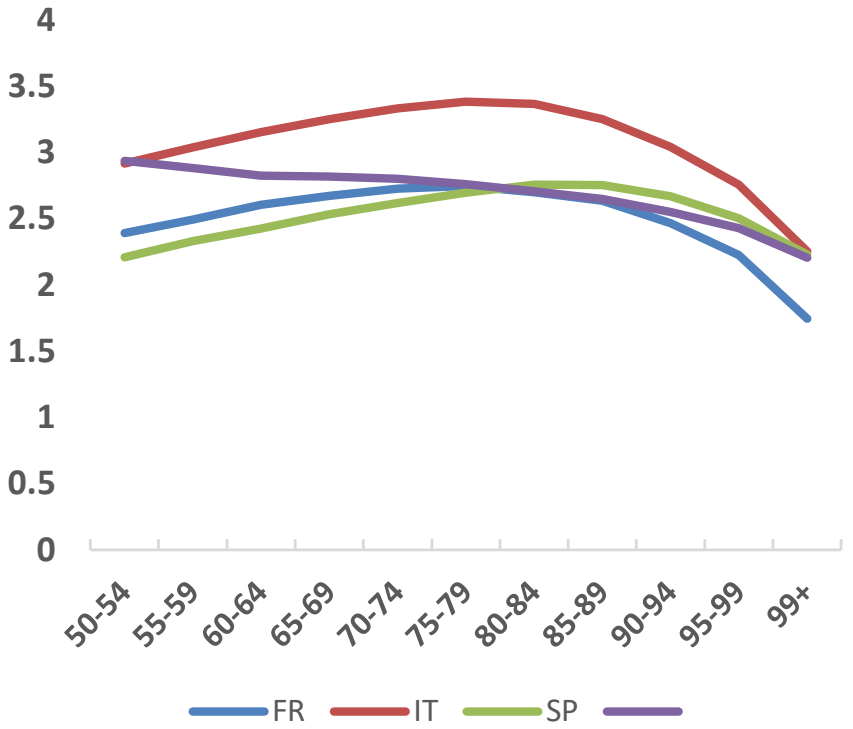
Average number of causes of death.
Deaths at 50+ in France, Italy, Spain and the US, 2017

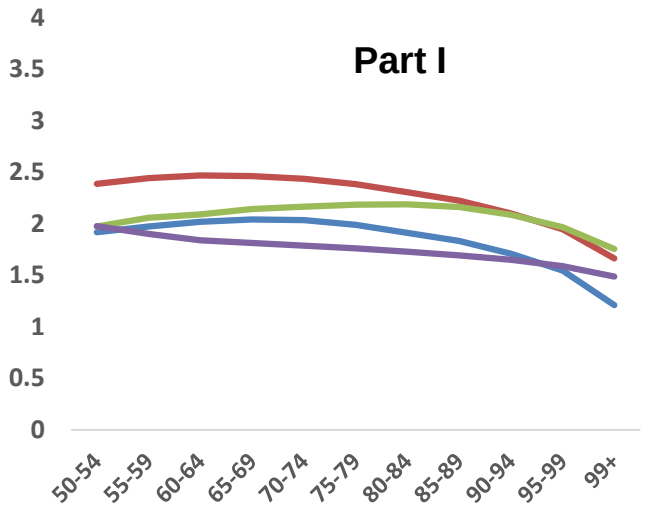


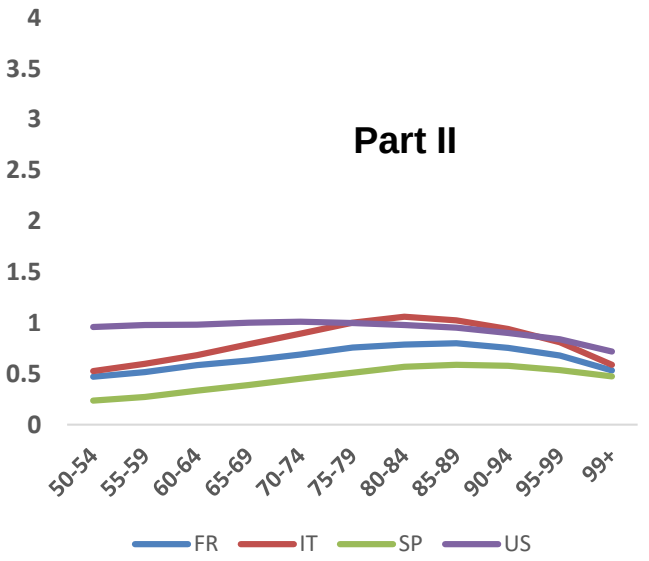




Average number of causes (ill-defined excluded) by age group
Deaths at 50+ in France, Italy, Spain and the US, 2017

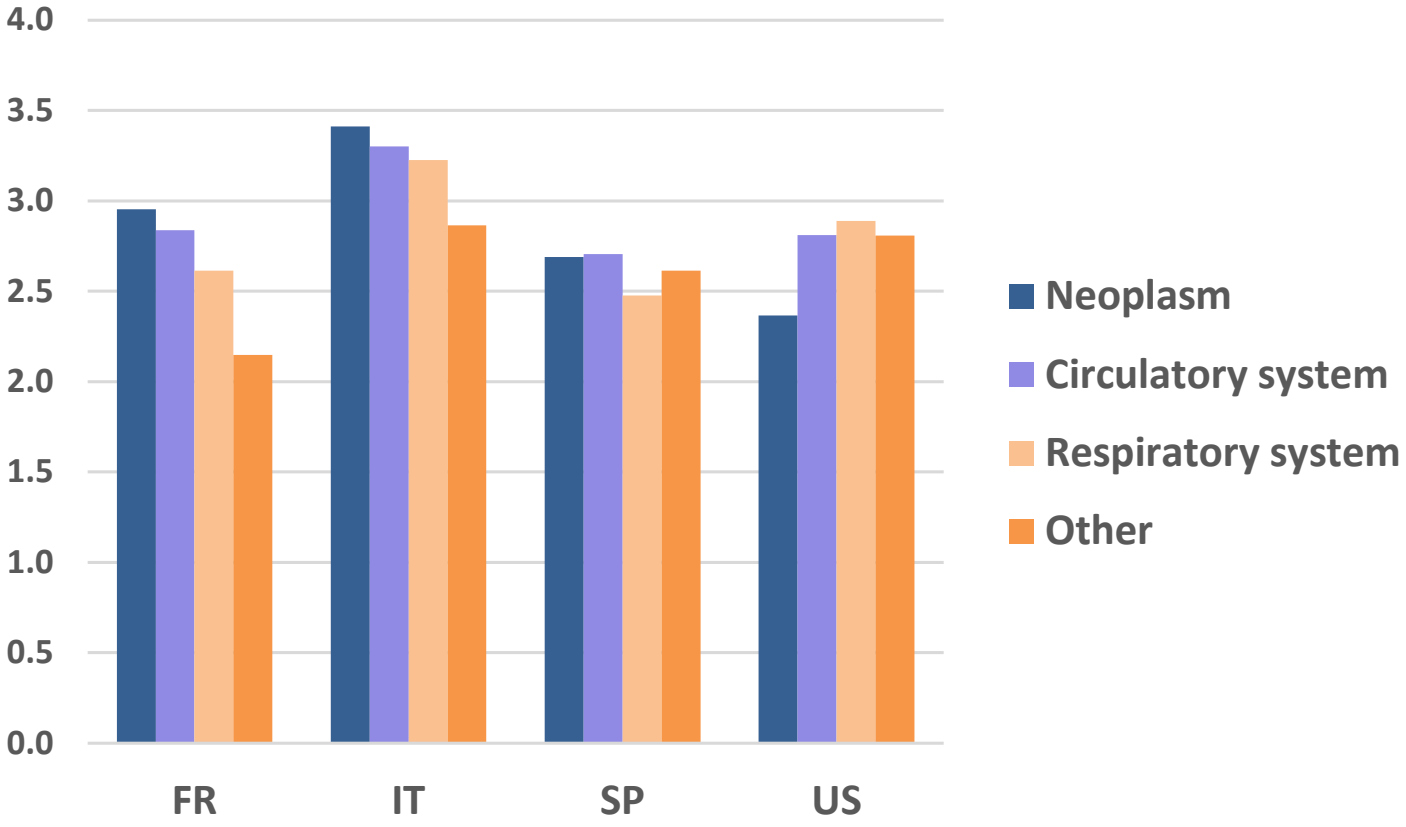






Average number of causes (ill-defined excluded) by underlying cause.

Deaths at 50+ in France, Italy, Spain and the US, 2017



		France	Italy
Age at death	1-39	0.92	0.85
	40-49	0.95	0.91
	50-59	0.97	0.93
	60-69	0.99	0.96
	70-79	*Ref*	*Ref*
	80-89	0.98	ns
	90+	0.93	0.91
Sex	Males	1.03	1.02
	Females	*Ref*	*Ref*
UCD	Infectious and parasitic	1.07	1.13
	Neoplasm	ns	1.02
	Blood and blood forming organs	1.11	ns
	Endocrine, nutritional, metabolic	1.18	1.15
	Mental and behavioural disorders	0.96	0.81
	Nervous system	0.93	0.87
	Circulatory system	*Ref*	*Ref*
	Respiratory system	0.96	0.93
	Digestive system	1.12	1.06
	Skin and subcutaneous tissue	ns	0.30
	Musculoskeletal system	1.25	1.10
	Genitourinary system	1.12	0.98
	Other	1.20	1.09
	Ill-defined	0.44	0.36
Marital status	Divorced	ns	ns
	Widowed	ns	ns
	Never married	0.99	0.98
	Married	*Ref*	*Ref*
Place of death	Private residence	0.87	0.90
	Hospital	*Ref*	*Ref*
	Residence for elderly people	0.96	1.04
	Other	0.89	0.96

Impact of various decedent characteristics on the number of causes reported on the death certificate: Relative risks estimated by a Poisson model. Deaths over the age of 1, France and Italy 2003.

Source: Désesquelles A.F. et al. (2012)

Coping with this heterogeneity

- Considering the whole process of producing data on multiple causes of death, there can be a certain heterogeneity that influences the indicators that are computed
- It must be taken into account when interpreting results, and more especially when making cross-country comparison

What for?
Four main ways to contribute to death

- The contributing cause is **a consequence or a complication** of the UC
- The contributing cause is **a consequence of the therapy of the UC**
- The contributing cause is a **risk factor for the UC**
- The contributing cause is a "**background factor**" (Manton and Stallard 1982)

Consequence/complication of the UC

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a) Gastrointestinal haemorrhage	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d) Stomach cancer	.....
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

**This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.*

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I		
Disease or condition directly leading to death*	(a) Epilepsy	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d) Brain cancer	.....
II		
Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

**This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.*

Consequence of the therapy of the UC

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a) Diseases of the blood, Infectious disease, etc	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d) Any cancer	.....
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

**This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.*

Risk factor for the UC

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I		
Disease or condition directly leading to death*	(a)	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d) Lung cancer	.....
II		
Other significant conditions contributing to the death, but not related to the disease or condition causing it	Use of tobacco	.....
	.....	.....

*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.

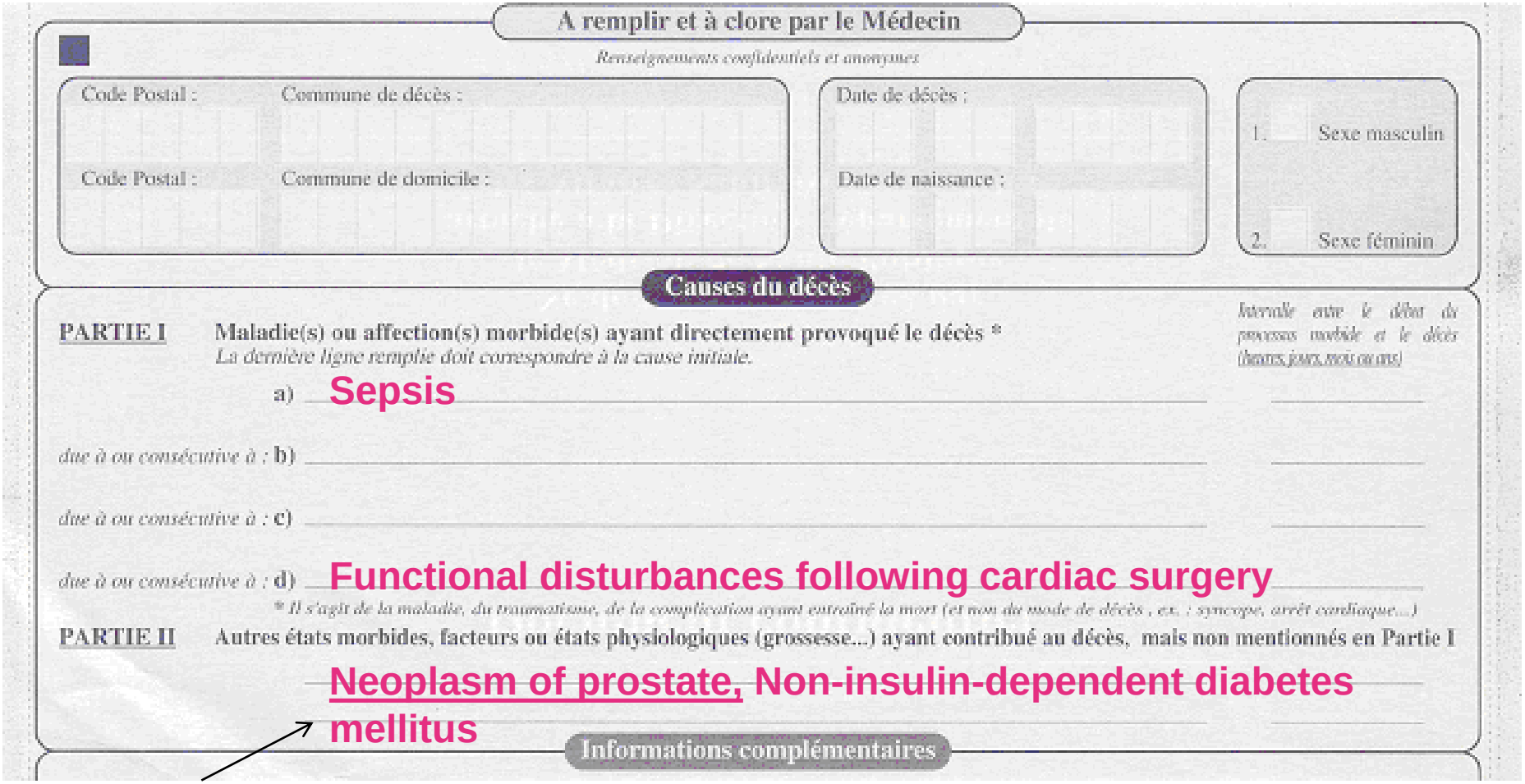
“Background factor”

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a)	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d)	.....
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	**Hypertension, Diabetes, Chronic kidney disease, Obesity, etc**	.....

**This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.*

Selecting the underlying cause: a complex decision-making process



Selected underlying cause

Multiple cause-of-death (MCOD) analysis: an instrument for health policies

- The contributing causes can be the target of prevention policies
- Omitting the entries on death certificates as contributing causes leads to underestimate the role played by certain conditions in mortality

- Two main purposes:

→to evaluate the impact on cause-specific mortality levels of taking into account all entries on death certificates

→ to examine the combinations of causes involving a given condition

Standardized Ratio of Multiple to Underlying cause

We calculate age- and sex- standardized mortality rates for:

1) a given cause reported as UC
2) the same cause reported either as UC or CC

The Standardized Ratio of Multiple to Underlying cause (SRMU) is the ratio between these two rates

Example :

A SRMU of 1 means that, when reported on a death certificate, the cause is always selected as the UC

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Population & Societies

Version française

We only die once… but from how many causes?

Aline Désesquelles,* Andrea Gamboni,** Elena Demuru** and the MultiCause network♦

When a person dies, the certifying physician records the cause of death on the death certificate. In many cases, several causes are mentioned, as well as the train of events that led to death. Aline Désesquelles and her colleagues explain why this type of information is useful for studying trends in causes of death in a country, and why international comparisons are difficult, notably because of cross-national differences in the ways medical certificates are completed.

Life expectancy in France has increased considerably over recent decades, thanks mainly to a decline in mortality from circulatory diseases and cancers, the two leading causes of death. We know this because statistics on all causes of death are compiled by the CépiDc (Centre d'épidémiologie sur les causes médicales de décès), the French body responsible for producing cause-of-death data from the certificates filled in by physicians when they certify a death (Box 1). Analysing causes of death sheds light on mortality

Box 1. Determining the cause of death

The medical certificate of death used in France complies with the recommendations of the World Health Organization (WHO). It is in two parts. In part I, the physician describes the train of events that led directly to the death. This first part has four lines, although physicians sometimes mention several causes on a single line. In part II, the physician is asked to indicate any other "morbidity, physiological factor or condition contributing to death but not involved in the process described in part I". In 2011, three-quarters of the causes mentioned on death certificates were given in part I, but for 30% of deaths, at least one other cause was listed in part II.

The information recorded by the physician is coded by the CépiDc which, again in compliance with WHO recommendations, determines the underlying cause, i.e. the disease or injury that initiated the train of events leading directly to death. In the majority of cases, and if the certificate is filled in correctly, this is the last cause listed in part I. All the other causes mentioned on the certificate, in both part I and part II, are called "contributing causes".

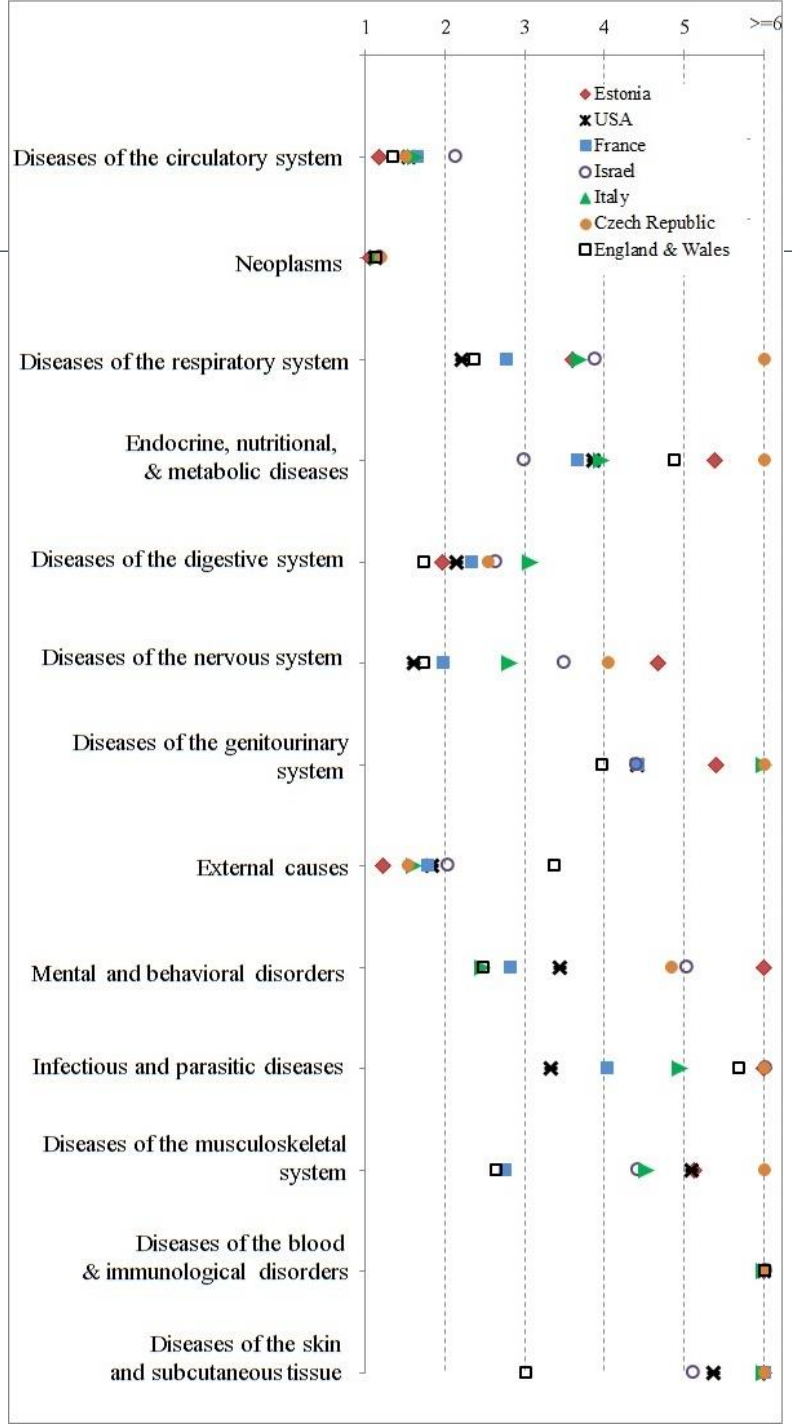
* French Institute for Demographic Studies.
** University of Rome.
♦ In alphabetical order: Magali Barbieri (INED/University of Berkeley), Gleb Denissov (Estonian Causes of Death Registry), Viviana Egidi (University of Rome), Luisa Frova (ISTAT), Nehama Goldberger (Israelian Ministry of Health), Emily Grundy (London School of Economics), Christopher Marshall (University College London), France Meslé (INED), Marilena Pappagallo (ISTAT), Marketa Pechholdova (University of Economics, Prague), Luule Sakkeus (Estonian Institute for Population Studies).

SRMUs for 7 countries (2009)

One dies only once… but from how many causes?

Aline Désesquelles, Andrea Gamboni, Elena Demuru & the MultiCause network

Population and Societies, n°534



Cause-of-death association indicator (CDAI)

We calculate the age-standardized prevalence of:

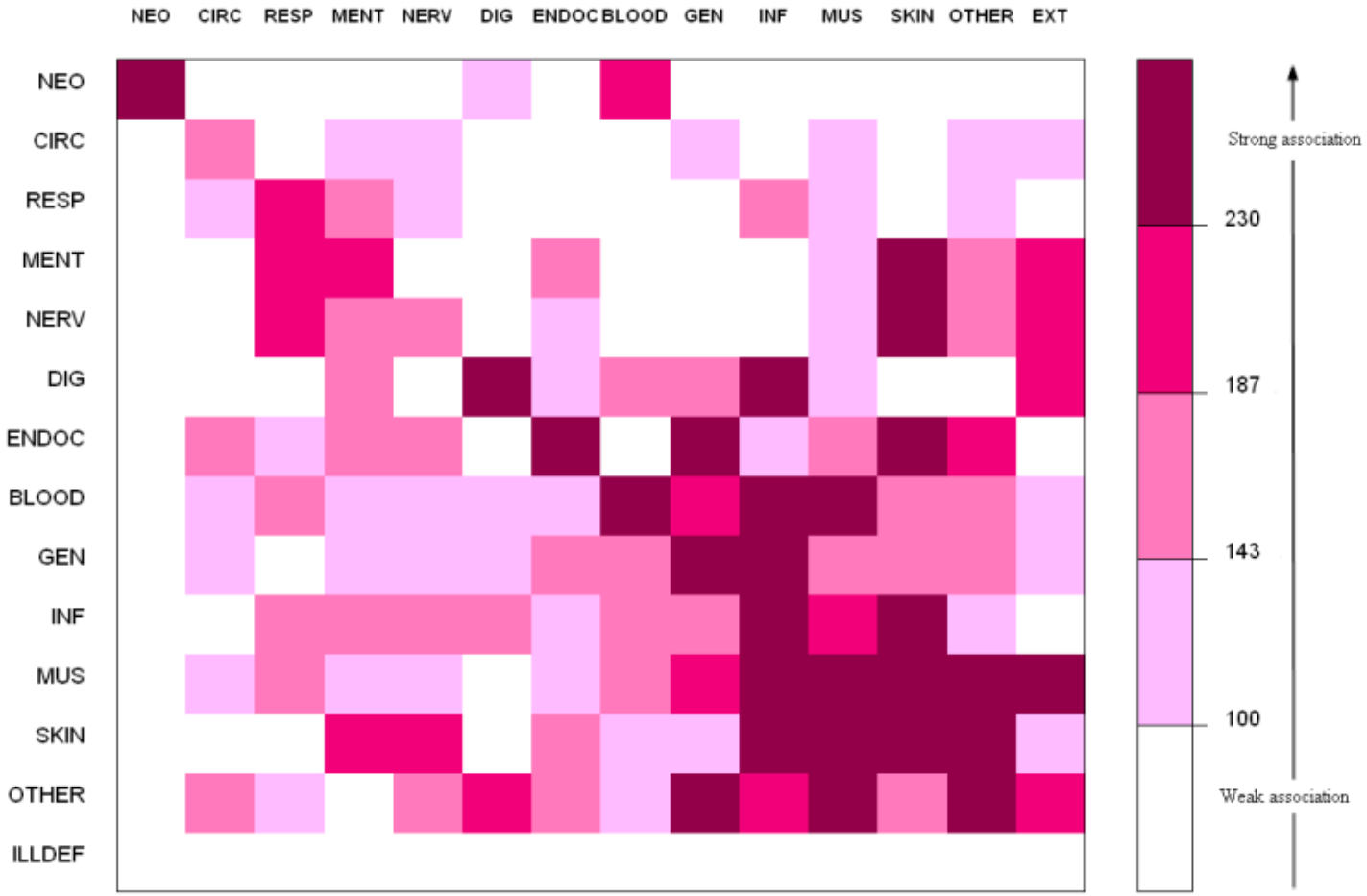
1) a given CC among all deaths due to a given UC
2) the same CC among all deaths of the country.

The cause-of-death association indicator (CDAI) is the ratio between these two prevalences

A CDAI significantly over 1 means that the association is more frequent than what is expected under the assumption of independence of causes

Cause-of-death association indicator (CDAI)

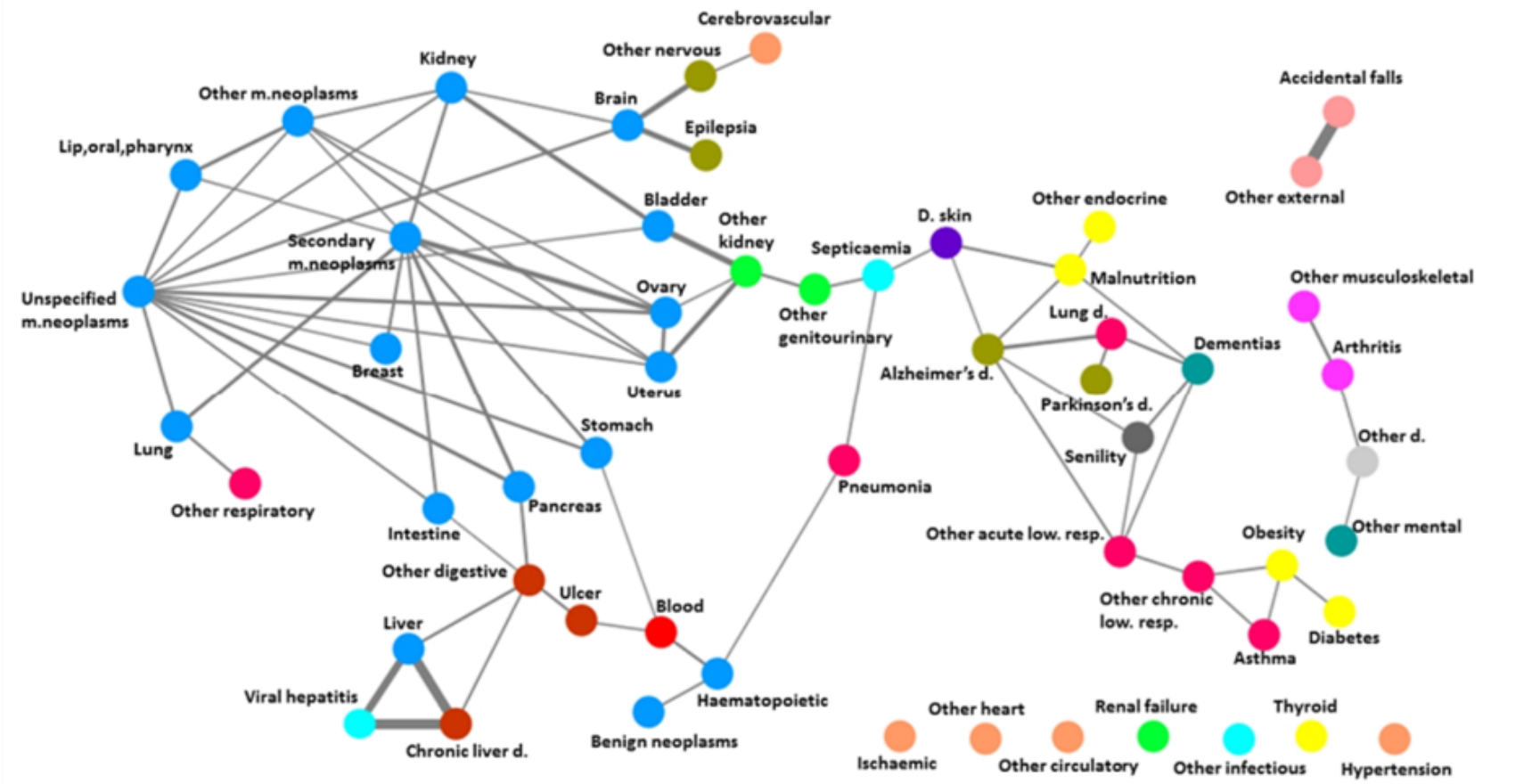
Example: CDAIs –Deaths over the age of one, excluding deaths from external causes, France, 2003



Désesquelles et al. 2010

Network analysis

Example: Strongest links between causes of death (> 95th percentile) for women older than 65 (Italy, 2011)



Egidi et al. 2018

Overweight and obesity

Multiple cause of death data can be used to analyse the role of risk factors in contributing to mortality.

One such risk factor is overweight and obesity – a leading risk factor for mortality (top 5 in USA and Australia), with high and increasing prevalence in many countries, especially in younger cohorts

Multiple cause data has been used to identify overweight- and obesity-related cardiovascular disease (CVD) mortality:

→ **any CVD reported in Part 1 or Part 2 the death certificate *with one or more of:***

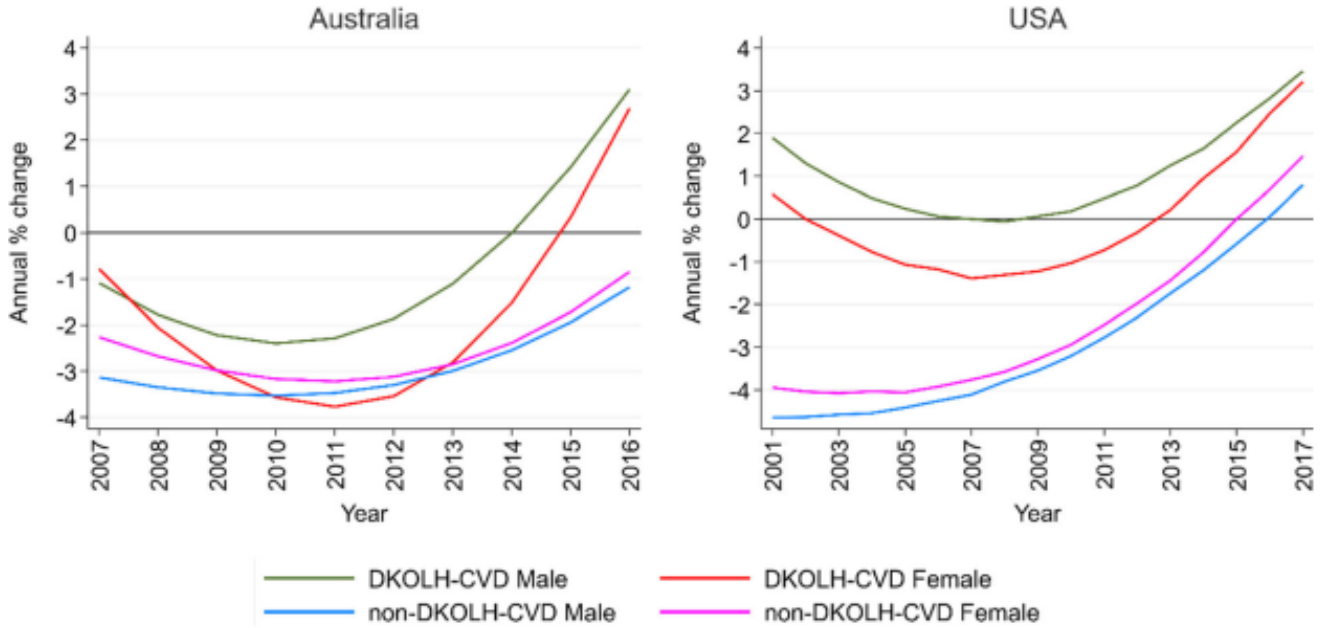
- **diabetes,**
- **chronic kidney disease,**
- **obesity,**
- **lipidemias, or**
- **hypertensive heart disease**

Named ***DKOLH-CVD*** → cluster of causes strongly associated with overweight and obesity.

Overweight and obesity

USA and Australia: DKOLH-CVD premature mortality rate (overweight- and obesity-related, 35-74 years) rose by 3% per annum in the most recent year.

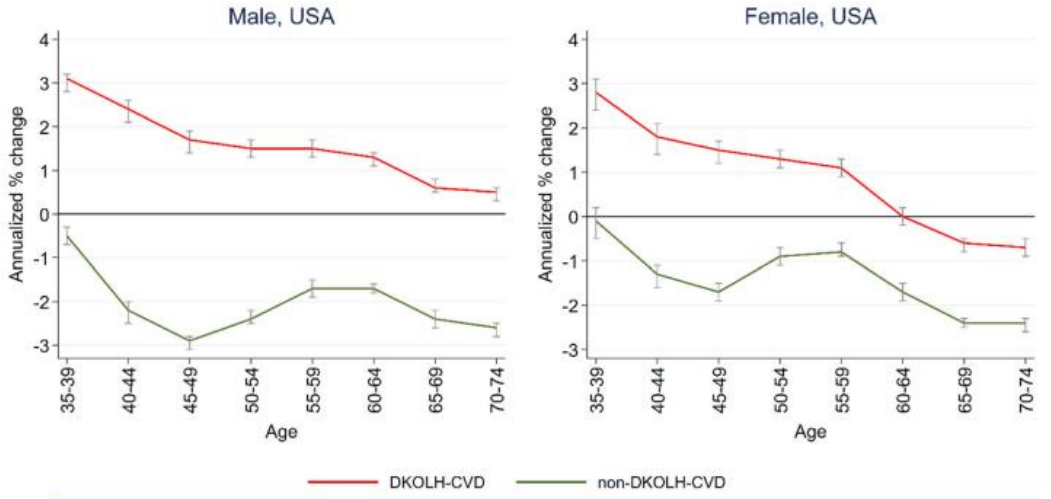
Trends in DKOLH-CVD mortality were worse than for non-DKOLH-CVD (other CVD mortality), especially in Australia.



Annual change in age-standardized DKOLH-CVD and non-DKOLH-CVD MCOD death rates (%), 35–74 years, by sex, Australia (2007–2016) and the USA (2001–2017)

Overweight and obesity

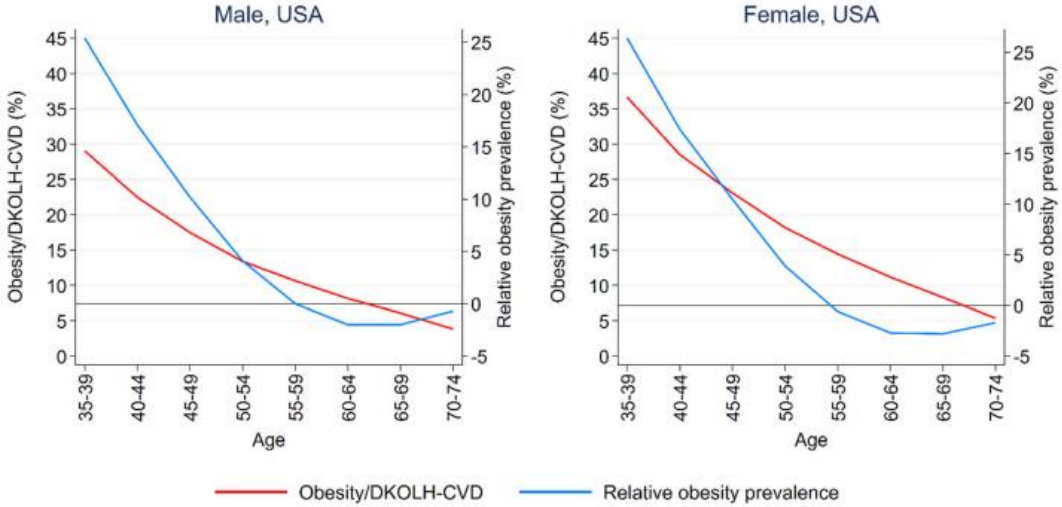
More adverse trends in DKOLH-CVD mortality rates at successively younger ages in the USA.



Annualized change in DKOLH-CVD and non-DKOLH-CVD MCOD age-specific death rates (% and 95% confidence intervals), by sex, USA 2005-17.

Age-specific mortality trends strongly correlated with:

- → proportion of DKOLH-CVD mortality with obesity reported
- → relative cohort lifetime obesity prevalence

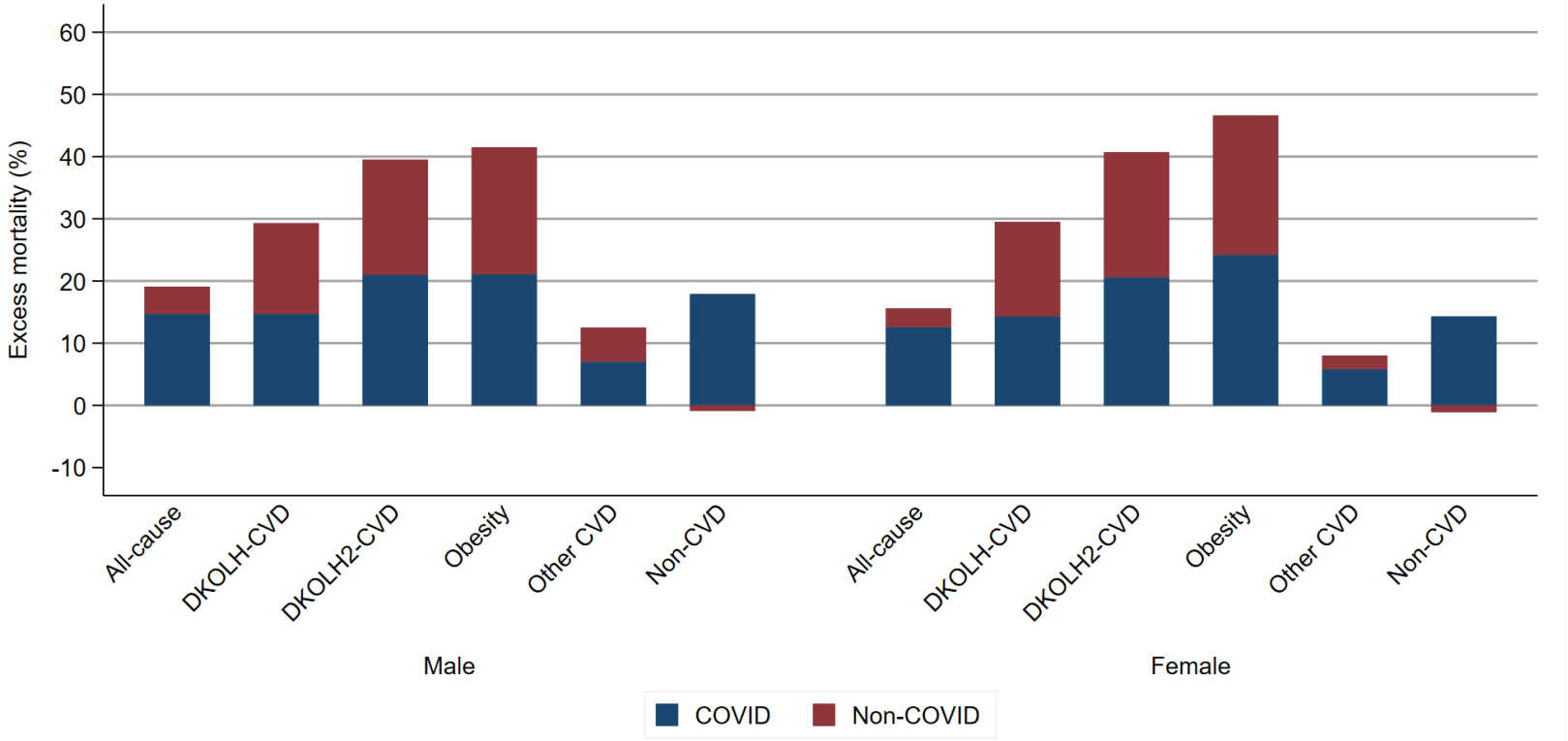


% of DKOLH-CVD deaths with obesity reported, by cohort age group, and relative lifetime obesity prevalence of cohort, 1980–2015, USA 2005–17

Overweight and obesity

Estimation of excess premature CVD mortality attributable to overweight and obesity during the COVID-19 pandemic in the USA.

Excess mortality from overweight and obesity much higher than from other causes.

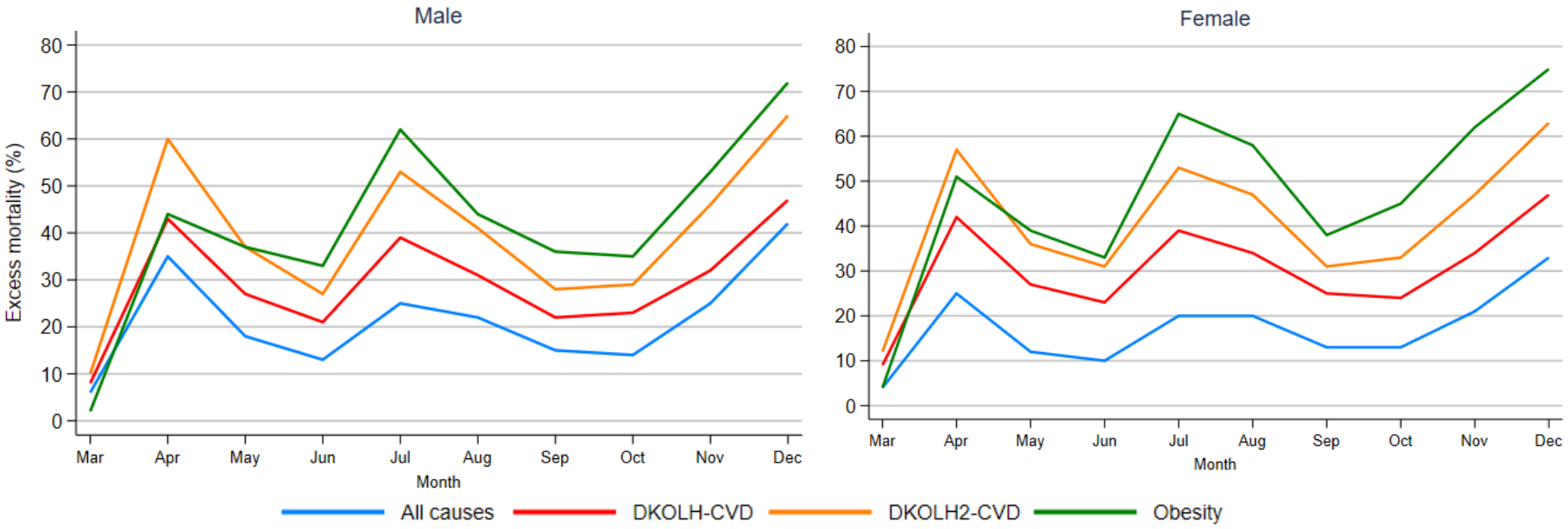


Excess mortality (%, based on age-standardised death rate 35-74 years), and % of excess mortality due to COVID-19, by sex and cause of death, US, March-December 2020

DKOLH2-CVD = CVD and 2 or more of DOKOLH conditions

Overweight and obesity

An advantage of multiple cause data is they allow for more granular analysis, e.g. to show that excess premature CVD mortality due to obesity in the USA was **>70% higher than expected in December 2020.**



Excess mortality (%, based on age-standardised death rate 35-74 years), by sex, month of death and cause of death, US, March-December 2020

References

Adair, T., Lopez, A.D., The role of overweight and obesity in adverse cardiovascular disease mortality trends: an analysis of multiple cause of death data from Australia and the USA. *BMC Medicine*, 2020, 18, 199. https://doi.org/10.1186/s12916-020-01666-y

Adair, T., Premature cardiovascular disease mortality with overweight and obesity as a risk factor: Estimating excess mortality in the United States during the COVID-19 pandemic, *International Journal of Obesity*, 2023. https://doi.org/10.1038/s41366-023-01263-y

AFTER THE EPIDEMIOLOGIC TRANSITION: A REASSESSMENT OF MORTALITY FROM INFECTIOUS DISEASES (ID) IN FRANCE AND ITALY USING THE MULTIPLE CAUSE-OF-DEATH APPROACH

In the context of increased life expectancy : increased susceptibility of the older persons to infections that also are frequently more severe and more difficult to treat

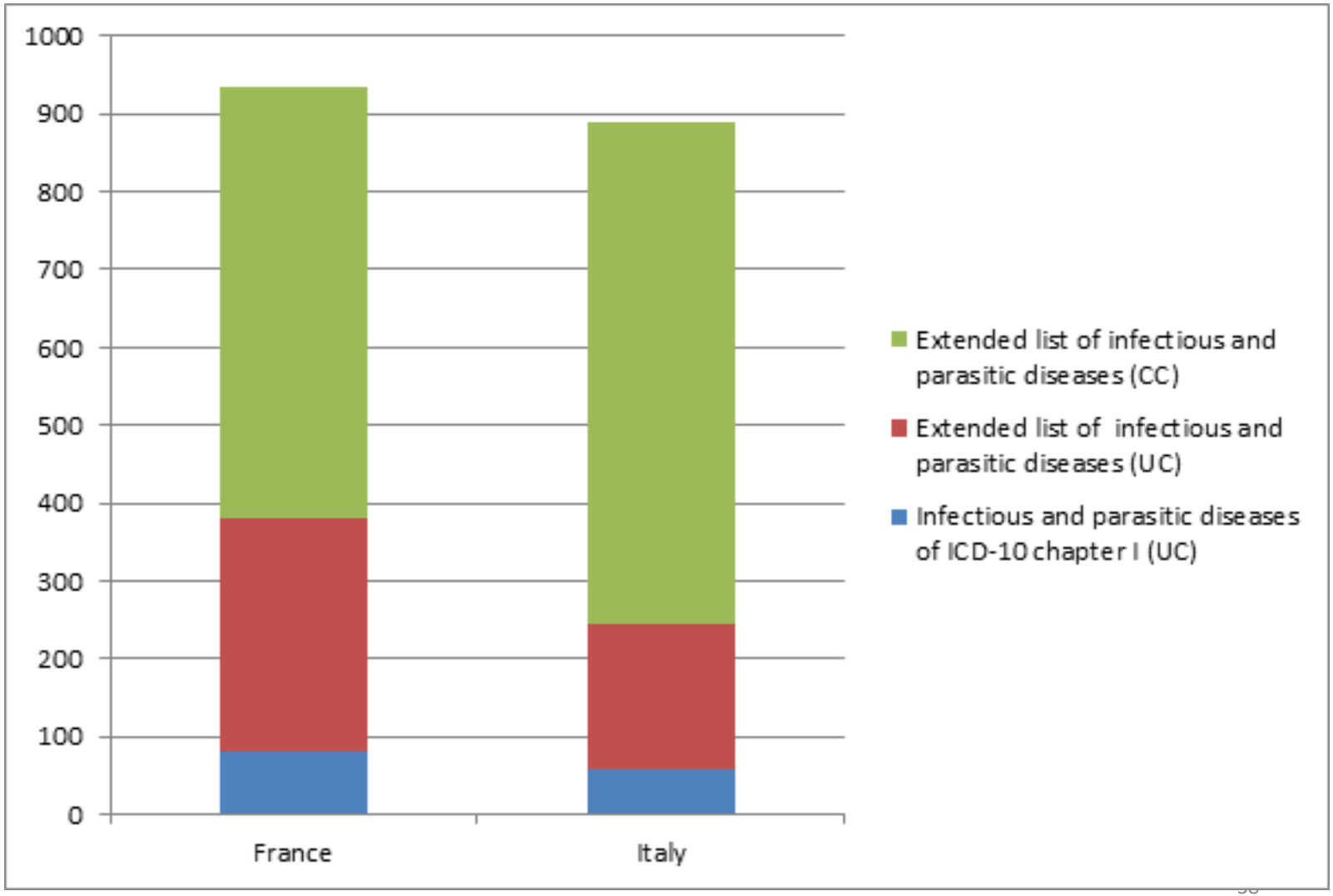
Infectious diseases are frequent complications of other diseases/therapies

Désesquelles A., Demuru E., Pappagallo M., Frova L., Meslé F., Egidi, V. (2016) Infectious diseases in ageing populations: a neglected cause of mortality? N-IUSSP newsletter, March 21, 2016

Extended list of infectious&parasitic diseases

Infectious and parasitic diseases	ICD-10 code	Examples
Tuberculosis **AIDS (HIV-disease)** **Viral hepatitis** **Septicaemia** **Intestinal infectious diseases** **Other Infectious and parasitic diseases of chapter I**	**A00-B99**	
Influenza Pneumonia	J09- J11 J12-J18	
Infectious diseases of chapter IX (circulatory system)	I00-I02, I30.1 & I30.9, I33, I38, I40.0, I80	Pericarditis, Phlebitis, Thrombophlebitis, Endocarditis
Other infectious diseases of chapter X (respiratory system)	J00-J06, J20-J22, J31-J32, J34.0, J36, J37, J39.0 & J39.1, J40-J41, J85, J86	Respiratory infections Bronchitis
Infectious diseases of chapter XI (digestive system)	K02, K04, K05.0, K05.1, K05.2, K05.3, K10.2, K11.3, K12, K14.0, K14.1, K14.2, K20, K35-K37, K40.1 K40.4, K41.1, K41.4, K42.1, K43.1, K44.1, K45.1, K46.1, K57.0, K57.2, K57.4, K57.8, K61, K63.0, K65, K75.0, K81,K85	Appendicitis, Peritonitis Hernia with gangrene Abscess of intestine Abscess of liver
Infectious diseases of chapter XII (skin & subcutaneous tissue)	L04, L00-L08, L88-L89	Infections of the skin and subcutaneous tissue Decubitus ulcer and pressure area Pyoderma gangrenosum
Infectious diseases of chapter XIII (musculoskeletal system and connective tissue)	M00, M02, M60.0, M65.0, M65.1, M71.0, M71.1, M86	Pyogenic arthritis Infective myositis Osteomyelitis
Infectious diseases of chapter XIV (genito-urinary system)	N10-N12, N13.6, N15, N30 N34, N39.0, N41, N43.1, N45, N48.1 N48.2, N49, N61, N70-N73, N75-N76	Urinary tract infection Inflammatory disorders of genital organs
Infectious diseases of chapter XVIII (ill-defined causes)	R02, R50.8, R50.9, R56.0, R75, R82.7	Gangrene Fever
Infectious diseases of chapters III, IV, VII, VIII, XV and XVI	D733, E06.0 & E06.1, G00, G04, G06, G08, G09, G61, H00, H01.0, H01.8 & H01.9, H10, H16, H20, H30, H44.0, H44.1, H46, H04.3, H05.0, H60.0, H60.1, H60.2, H60.3, H60.8, H60.9, H65.0, H65.1, H65.2, H65.3, H66, H68.0, H70, H73.0 O03.0 , O03.5, O04.0, O04.5, O05.0, O05.5, O06.0, O06.5, O07.0, O07.5, O08.0, O23, O26.4, O41.1, O75.2, O75.3, O85, O86, O88.3, O91, O98, P00.2, P02.7, P23, P35-P39, P58.2, P78.0, P78.1,P77	Encephalitis, myelitis and encephalomyelitis Thyroiditis Inflammatory polyneuropathy Abortion complicated by genital tract and pelvic infection Infection during labor Congenital viral diseases

Standardized mortality rates (per 100,000) based on the underlying/multiple causes, and for a restricted/extended list of infectious diseases. Deaths at age 65+, France and Italy, 2009



Data: France : Inserm CépiDc & ISTAT cause-of-death databases

COVID-19 mortality in Brazil, 2020-2021

In Brazil, more than 650,000 deaths due to COVID-19 were registered in the Mortality Information System, in 2020 and 2021.

The multiple cause-of-death approach helped us to describe the morbid process of COVID-19 mortality and its association with other causes, especially with non-communicable diseases in Brazil.

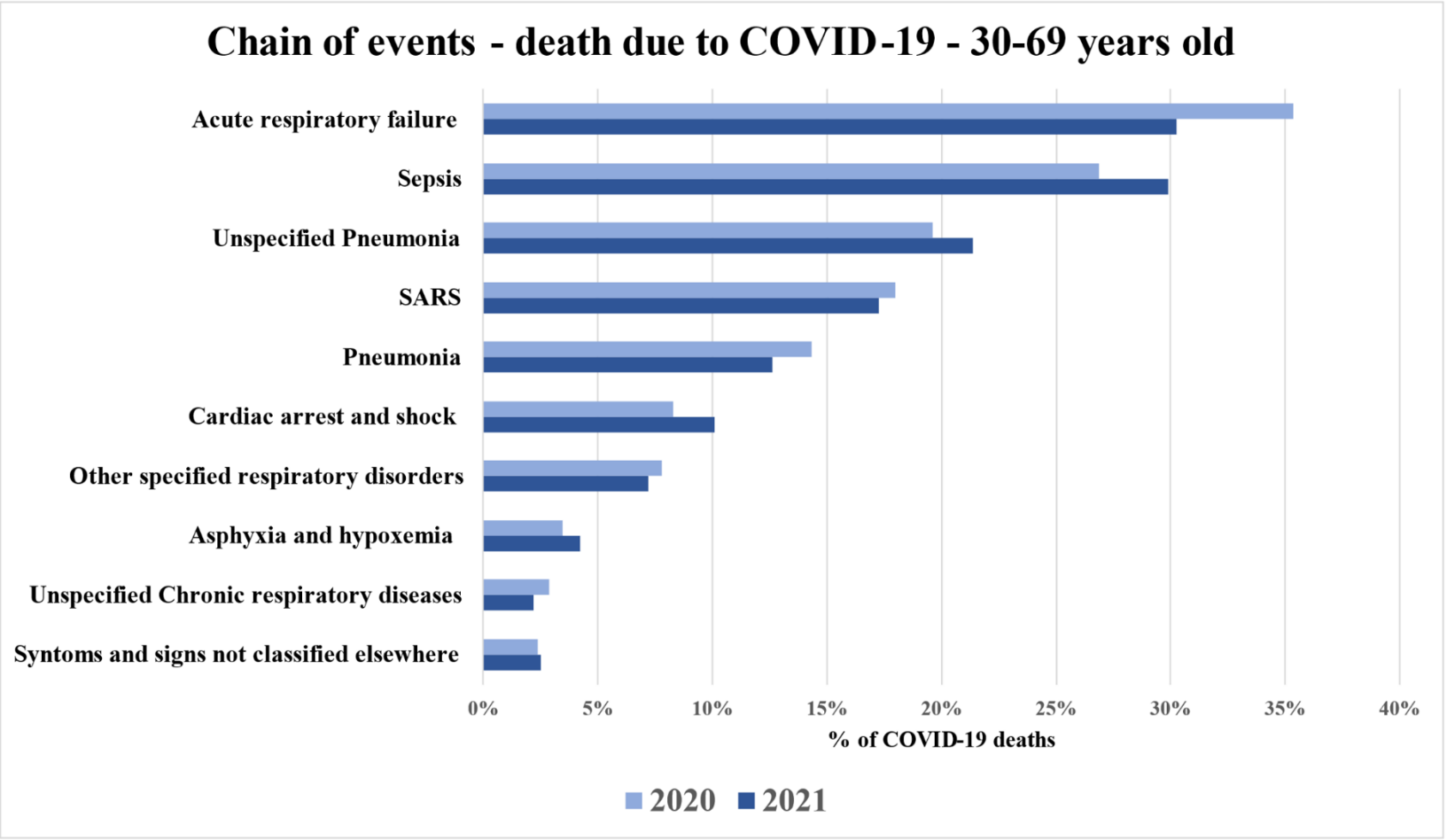
The conditions (causes) mentioned on the death certificate were classified as:

- **Chain of event**: conditions that appeared more frequently (60% or more) in the same line or above the code for COVID-19 (B34.2, U0.7.1, U07.2) in Part I
- **Contributing**: conditions that appeared more frequently (60% or more) after the codes for COVID-19 in Part I or, mainly, in Part II

Nogales-Vasconcelos, AM, Ishitani, L, Abreu, DMX, França, E, (2022), Covid Adult Mortality in Brazil: An Analysis of Multiple Causes of Death, Front. Public Health

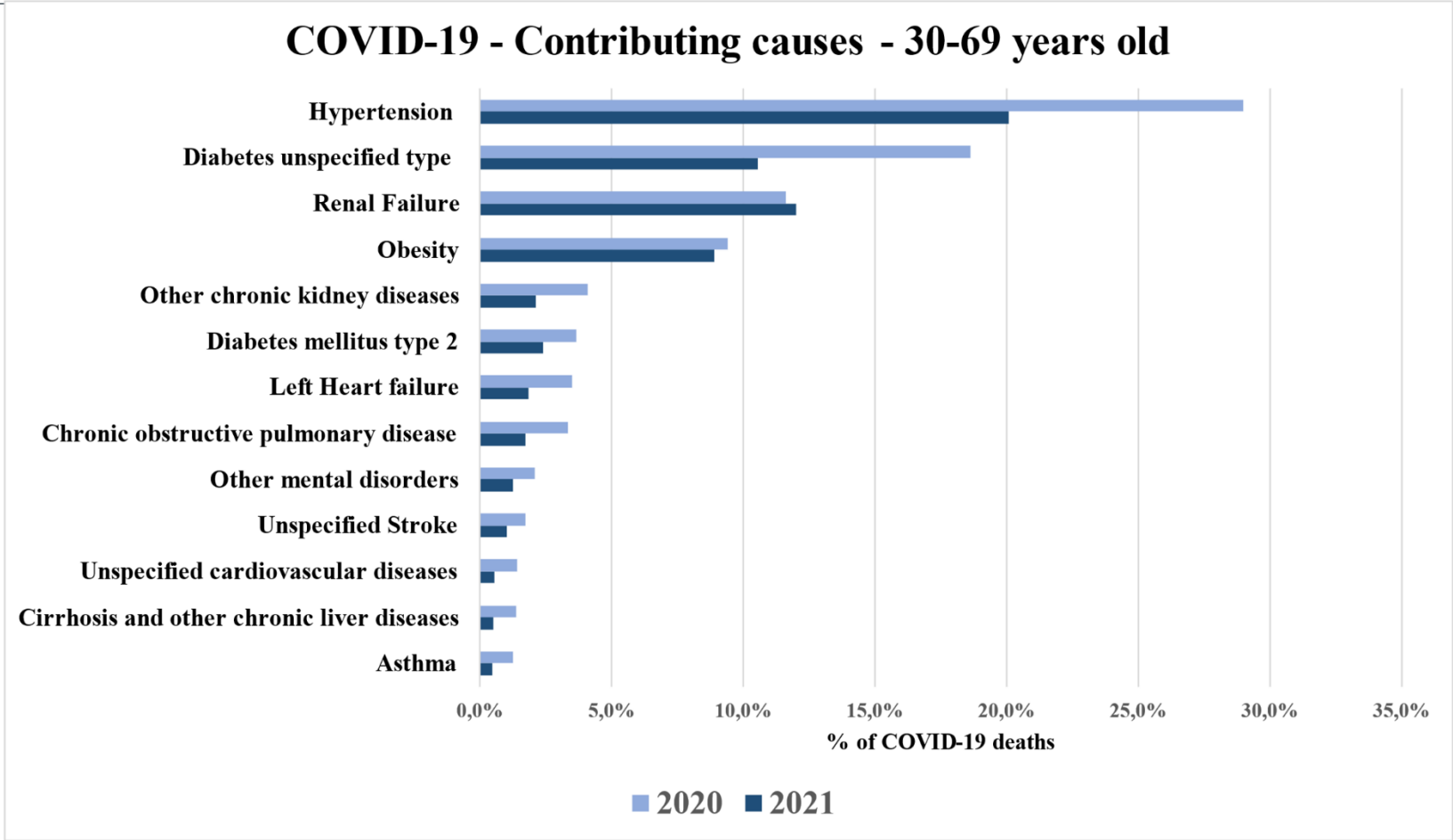
Nogales-Vasconcelos, AM et al, Covid mortality in Brazil, (2022), IUSSP Conference.

COVID-19 mortality in Brazil, 2020-2021



OBS: The ICD10 codes were grouped into groups with similar diagnoses. These groups were based on the Global Burden of Diseases study (GBD 2017) and adapted to the Brazilian epidemiological profile.

COVID-19 mortality in Brazil, 2020-2021



The multiple cause-of-death analysis is a powerful tool to better understand the morbid processes due to COVID-19 and highlight the importance of chronic non-communicable diseases as contributing conditions.

Activities of the panel

Webinar once a year (next one: Thursday 28 September at 11:00-12:30 UTC): one/two presentations. Suggestions for presentations or for topics are welcome!

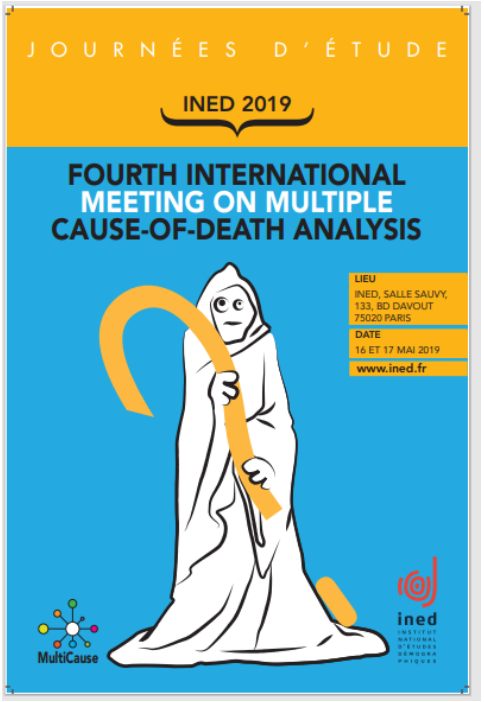
Sharing information (publications, events…)

The MultiCause Network

Established in 2012, the network regroups more than 100 researchers/statisticians (users as well as data producers) from about 20 countries.

Aim : to foster analysis based on multiple cause-of-death data and to discuss methods.

- Mailing list: multicause@listes.ined.fr
- WIKI website (restricted access): https://mcod.web.ined.fr/wiki/AccueilTo
- Scientific meetings : Paris (2012), Rome (2014), Prague (2016), Paris (2019), Bonn (2022)



If you are interested in joining: send a message to **multicauseworkshop@listes.ined.fr**

Activities of the panel

Webinar once a year (next one: Thursday 28 September at 11:00-12:30 UTC): one/two presentations. Suggestions for presentations or topics are welcome!

Sharing information (publications, events…)

Session at the next IUSSP conference in Brisbane (2025)

Other outputs:

- Training session?
- Publication (i.e special issue of a journal)?

Thank you for your attention!