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# ***Dementia in migrants living in the Lazio region: exploring prevalence and mortality relying on health information systems***

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*“Dementia in migrants living in Italy:  
promoting a diversity-sensitive clinical approach and provision of care”*

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*Italian National Health Institute, Rome*

# Background and objectives

- As part of the IMMIDEM project,
- Using a population-based approach and routinely collected health administrative data



- Identification and description of migrants living with dementia in the Lazio region of Italy.
- Estimation of prevalence of dementia among migrants compared with Italian-born residents
- Investigation of all-cause mortality among migrants living with dementia in the Lazio region of Italy as compared to Italian-born individuals.



# Case Identification and Characterization of Migrants with Dementia in the Lazio Region Using Health Administrative Data

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## ➤ Study population

Individuals aged  $\geq 50$ , living in Lazio and receiving assistance from the Regional Health Service as of December 31, 2018.

## ➤ **Dementia case identification**

A validated algorithm based on Health Information Systems.

At least one of the following conditions:

- **hospital discharge(s)** in the previous five years with a primary or secondary diagnosis of dementia according to well-established codes from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) from the Italian National Plan for Dementia;
- at least one **prescription claim** for cholinesterase inhibitors (i.e., donepezil, rivastigmine, and galantamine) or memantine in the previous five years (Anatomical Therapeutic Chemical code N06D);
- previous activation of a **co-payment exemption** for dementia or Alzheimer's disease (codes 011 and 029).

## ➤ **Migratory status definition and classification**

Proxy variables → Country of birth or Citizenship

### ***Country of birth* from the Regional Health Assistance file**

Available for all individuals receiving assistance from the Regional Health Service

### ***Citizenship* from Rome Population Registry**

Available for individuals living in Rome

#### ▪ **NATIVE ITALIANS**

- **MIGRANTS**
  - **Highly Developed Countries (HDCs)** : Western Europe, Northern America, Oceania, Israel and Japan
  - **High Migratory Pressure Countries (HMPCs)**: Central-Eastern Europe, Central-Southern America, Northern Africa, Sub-Saharan Africa, Central-Western Asia and Easter Asia orientale.

## ➤ **Statistical analyses**

- Prevalence of dementia was estimated overall and by migrant status, and 95% confidence intervals (CI) were calculated.
- Dementia population characteristics were described and compared according to migrant status.

## ➤ **Population characteristics evaluated**

- Age class → 50-74; 75-84; 85+
- Sex
- Comorbidities
- Drugs (anti-dementia and anti-psychotic)
- Other drugs consumption

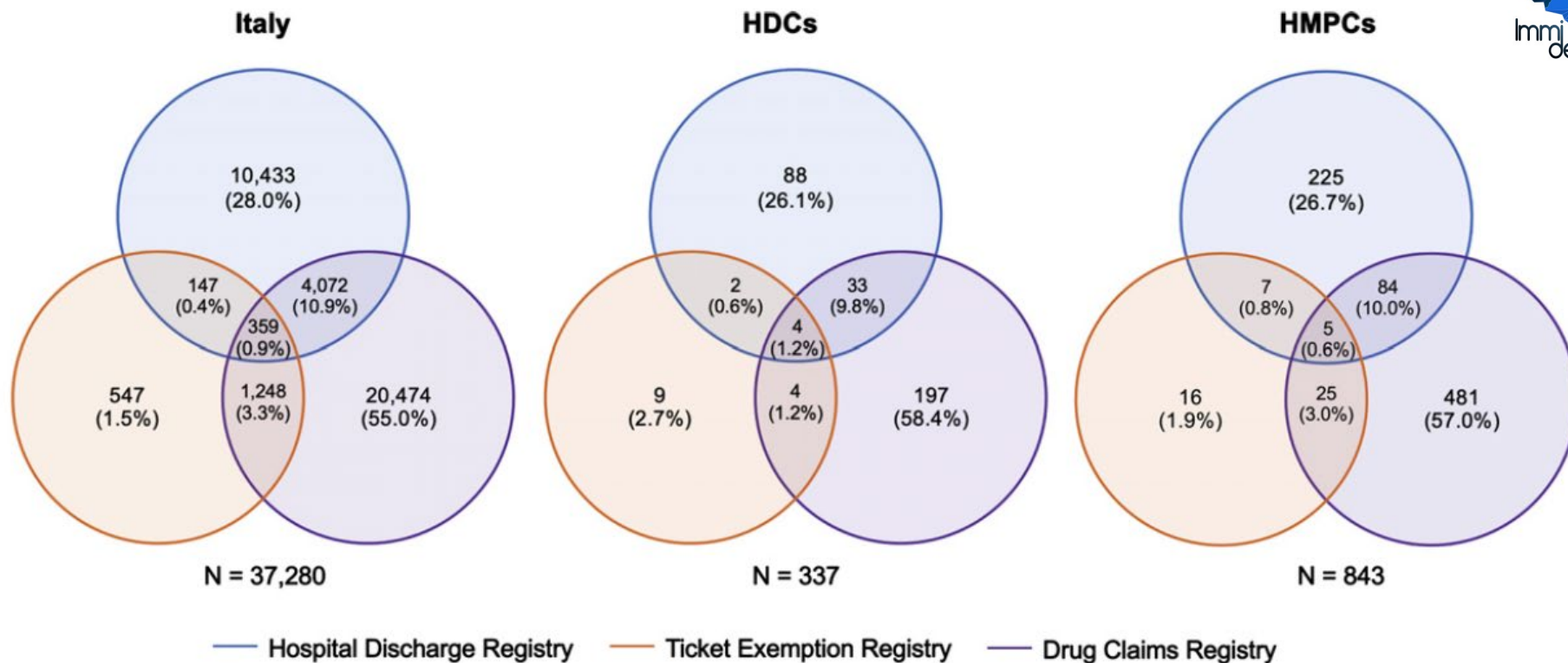
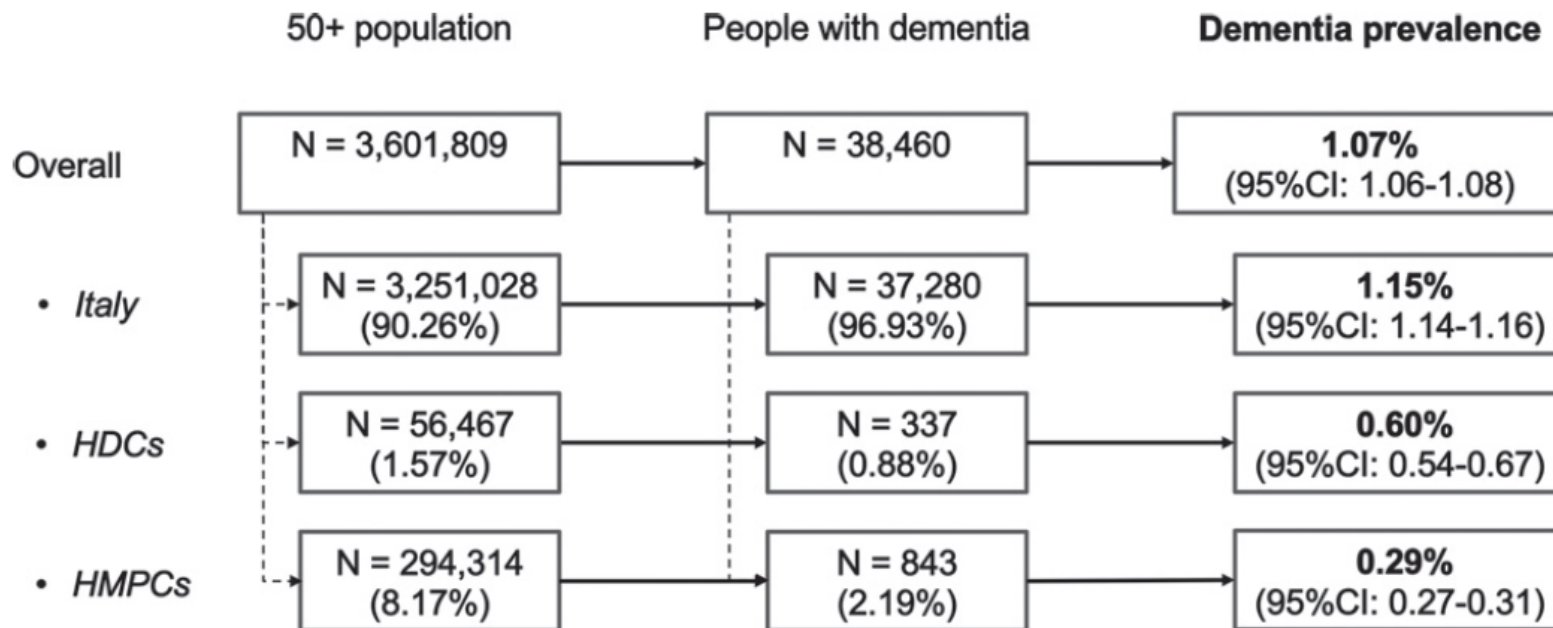


Fig. 2. Venn diagrams showing the number of dementia cases identified in each of the three healthcare and administrative datasets by migrant status and the intersects of these three data sources. HDCs, highly developed countries; HMPCs, high migratory pressure countries.

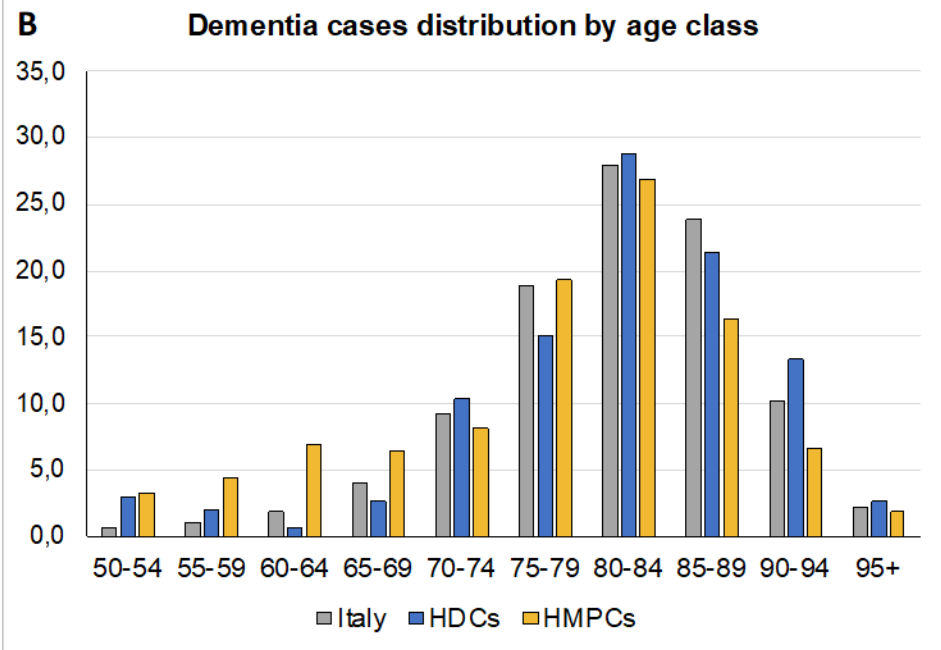
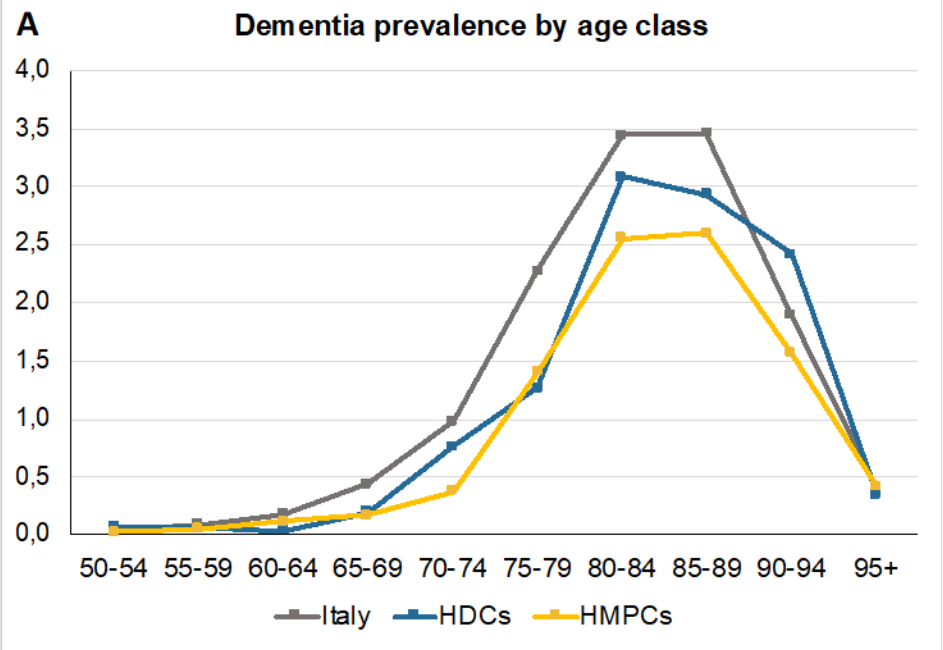


Age-standardized dementia prevalence (per 100 population) by country of birth and gender

	Italians			HDCs			HMPCs		
	std rate	95% IC		std rate	95% IC		std rate	95% IC	
Men	0.75	0.73	0.76	0.63	0.50	0.80	0.48	0.42	0.54
Women	1.07	1.06	1.09	0.73	0.64	0.83	0.67	0.61	0.73
Total	0.92	0.91	0.93	0.70	0.63	0.78	0.59	0.55	0.64

HDCs, highly developed countries; HMPCs, high migratory pressure countries.

## Cases and Prevalence of Dementia by age classes



## Demographic characteristics, comorbidities and use of antimentia and antipsychotic drugs

	Italy (N = 37,280)		HDCs (N = 337)		HMPCs (N = 843)		P*
	N	%	N	%	N	%	
<b>Sex</b>							<0.001
Men	13,132	35.2	77	22.8	260	30.8	
Women	24,148	64.8	260	77.2	583	69.2	
<b>Age classes</b>							<0.001
50-74	6,275	16.8	63	18.7	244	28.9	
75-84	17,460	46.8	148	43.9	390	46.3	
85+	13,545	36.3	126	37.4	209	24.8	
<b>Comorbidities (last 2 years)</b>							
Infectious diseases	1,197	3.2	8	2.4	32	3.8	0.43
Cancer	1,646	4.4	15	4.5	39	4.6	0.96
Cardiovascular diseases	10,257	27.5	88	26.1	221	26.2	0.60
Respiratory diseases	4,035	10.8	32	9.5	92	10.9	0.73
Gastrointestinal diseases	2,711	7.3	16	4.7	75	8.9	0.04
Genitourinary diseases	3,661	9.8	33	9.8	72	8.5	0.47
Psychiatric disorders	6,517	17.5	61	18.1	150	17.8	0.93
Endocrine/metabolic disorders	5,141	13.8	42	12.5	119	14.1	0.75
Musculoskeletal disorders	2,012	5.4	19	5.6	33	3.9	0.16
<b>Drugs (last 2 years)</b>							
Antimentia drugs	19,950	53.5	174	51.6	416	49.3	0.05
Antipsychotics	11,770	31.6	99	29.4	245	29.1	0.21
Antimentia and antipsychotics	5,728	15.4	47	13.9	117	13.9	0.39

## Drugs consumption


	Italy (N = 37,280)		HDCs (N = 337)		HMPCs (N = 843)		P*
	N	%	N	%	N	%	
Cardiac therapies	5,242	14.0	1	0.3	104	12.2	<0.001
Antihypertensive agents	27,923	74.8	214	63.5	532	62.7	<0.001
Lipid-modifying agents	13,352	35.8	101	30.0	271	31.9	<0.01
Statins	11,670	31.3	88	26.1	238	28.0	0.02
Antiplatelet agents	21,982	58.9	176	52.2	413	48.6	<0.001
Insulin and analogs	2,472	6.6	18	5.3	59	6.9	0.58
Blood glucose-lowering drugs	5,991	16.0	43	12.8	131	15.4	0.24
Antidepressants drugs	14,533	38.9	117	34.7	299	35.2	0.03
Anxiolytics	72	0.2	0	0.0	1	0.1	0.81
Hypnotics and sedatives	80	0.2	0	0.0	3	0.4	0.65
Analgesic drugs	3,725	10.0	38	11.3	72	8.5	0.28

- Routinely collected data in healthcare administrative databases can support the **identification of migrants with dementia**.
- Migrants exhibited a **lower age-standardized prevalence** of registered dementia and **lower access to dedicated treatments** than native Italians.
- These findings are suggestive of **underdiagnosis and undertreatment** of dementia in migrants



Research article

# Mortality in migrants with dementia living in Lazio, Italy: A 5-year cohort study

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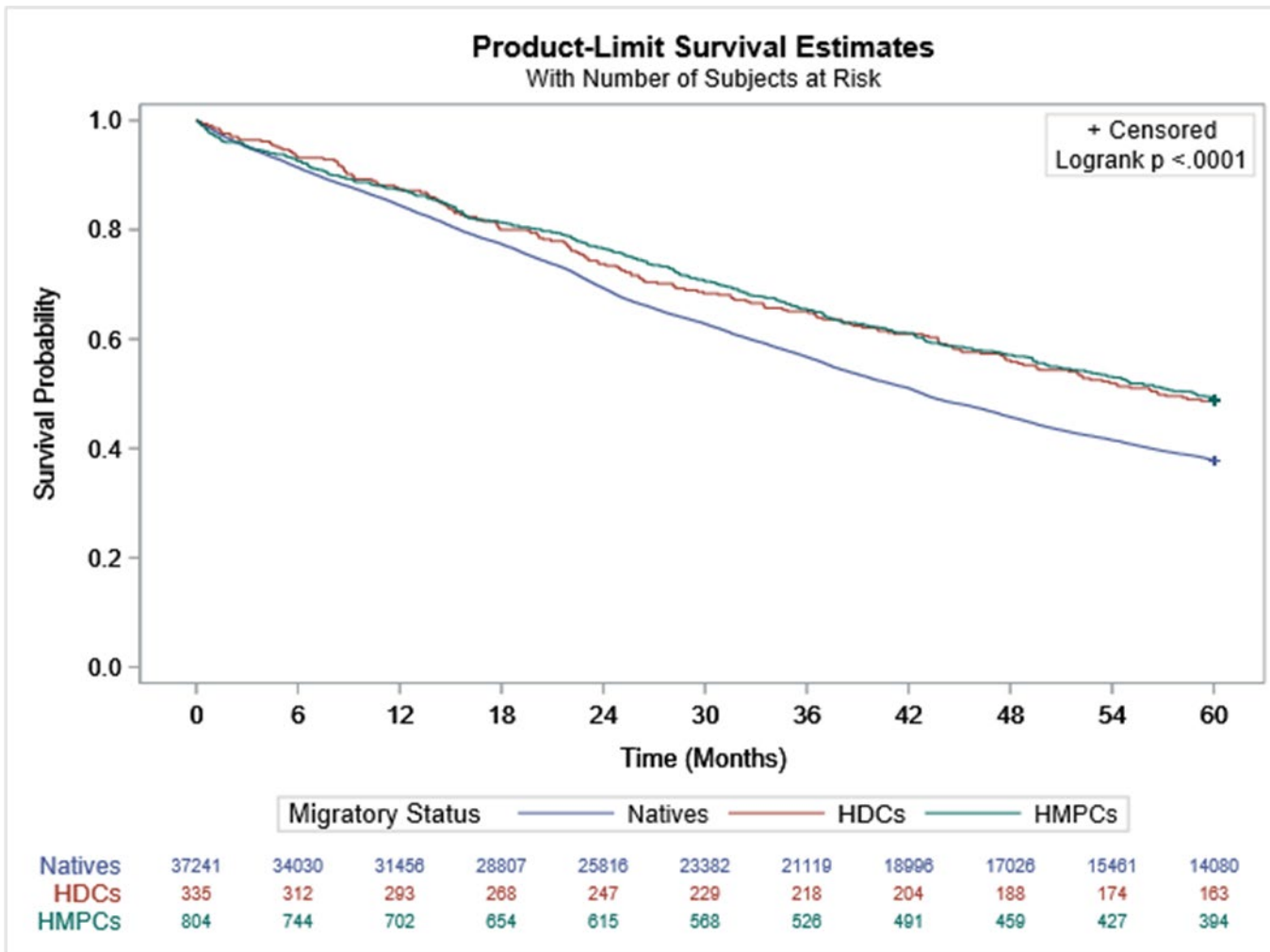
- In a **cohort study**, people with dementia aged  $\geq 50$  living in Lazio on 31<sup>st</sup> December 2018 were selected using Health Information Systems (HIS) and **followed-up for 5 years**.
- **Age-standardized mortality rate (SMR)** was estimated overall and by migrant status (mortality data from regional mortality registry).
- **Time to event (death) analysis** was performed using Kaplan-Meier curves, log-rank tests, and uni/multivariable Cox regression. Right censoring in case of end of health assistance in Lazio or death.

## Mortality rate and Relative risk follow up 31-12-2018 to 31-12-2023

TOTAL							
	Mean popultaion with dementia 31-12-2018	All causes deaths in population with dementia	Crude mortality rate*100	†SMR*100	95% CI	RR	95% CI
<b>Migratory status</b>							
Natives	37241	23186	62.30	36.80	(35.40; 38.40)	1.00	(0.94; 1.06)
HDCs	335	172	51.30	38.50	(22.20; 67.00)	1.05	(0.60; 1.82)
HMPCs	804	411	51.10	30.70	(26.40; 35.80)	0.83	(0.71; 0.98)

† Ref. Lazio population

## Kaplan Meier curve 5 years follow-up



## Cox model 5 years follow-up

**Table 3.** Age and sex-adjusted cox regression analysis (31 December 2023).

		Main Analysis				Subgroup Analysis*							
		Crude HR	95% CI		Adj HR	95% CI		Crude HR	95% CI		Adj HR	95% CI	
Migratory status	Natives/Italians*	1	–	–	1	–	–	1	–	–	1	–	–
	HDCs	0.77	0.66	0.90	0.79	0.68	0.91	0.67	0.44	1.02	0.61	0.40	0.93
	HMPCs	0.76	0.69	0.83	0.91	0.82	1.00	0.42	0.31	0.58	0.75	0.55	1.03

\*Subgroup analysis restricted to individuals living in Rome for whom information about citizenship was available. Age- and sex- adjusted analyses.

- Contrary to the initial hypothesis, these findings showed **lower mortality among migrants** compared with Italian-born patients, even after adjustment for age and sex, and confirmed in subgroup analyses using citizenship instead of country of birth.
- This apparent survival advantage may reflect **a combination of factors**, including selective migration dynamics, return migration (“salmon bias”), and underdiagnosis of dementia among migrants, rather than genuinely better health status.
- These results are consistent with the **migrant mortality advantage** in high-income countries, whereby migrants exhibit lower mortality than native populations despite socioeconomic disadvantage.

Several mechanisms may contribute to this pattern.

➤ ***Salmon bias***

Migrants in poorer health may **return to their country of origin** or relocate elsewhere, leading to an underestimation of mortality in administrative data.

➤ ***Different performance of HIS in identify dementia cases among natives and migrants.***

Case identification relies on the **contacts between individuals and health services** (hospital admissions, drugs use, co-payment exemption activation).

➤ ***Underdiagnosis of dementia in migrants***

Dementia identified mainly in **migrants who are healthier or more engaged with healthcare services.**

➤ ***Misclassification of the migratory status***

Due to the use of **proxy variables**

In conclusion

- ✓ **the lower mortality among migrants with dementia should be interpreted cautiously**, as it may reflect data artifacts and structural inequities rather than genuinely better outcomes.
- ✓ The findings highlight the complexity of interpreting mortality patterns in migrant populations and underscore the need for future studies incorporating **more detailed indicators of migration history** and **dementia severity** to better understand mortality patterns in this growing population.



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