

# CONGRESSO REGIONALE **SID-AMD** LAZIO

**DIABETOLOGIA 2024:**  
NUOVI SCENARI CLINICI  
E PROSPETTIVE TERAPEUTICHE



**ROMA, 29-30 NOVEMBRE 2024**

UNIVERSITÀ CAMPUS BIO-MEDICO DI ROMA

## NOVITÀ FLASH DAGLI STUDI CLINICI

### RIACE

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- **RIACE** is a multicentre observational, prospective cohort study that was conducted in 19 hospital diabetes centers in Italy
- **OBJECTIVES:**
  - eGFR as independent predictor of CVD morbidity and mortality in T2DM
  - The prevalence of eGFR reduction and its association with cardiovascular risk factors and albuminuria
- The RIACE **population** consists of 15,933 Caucasian patients with type 2 diabetes recruited in years 2007–2008
  - Exclusion criteria were dialysis or renal transplantation
  - 160 subjects were excluded due to missing or implausible values

**Data from the remaining 15,773 patients were analyzed**



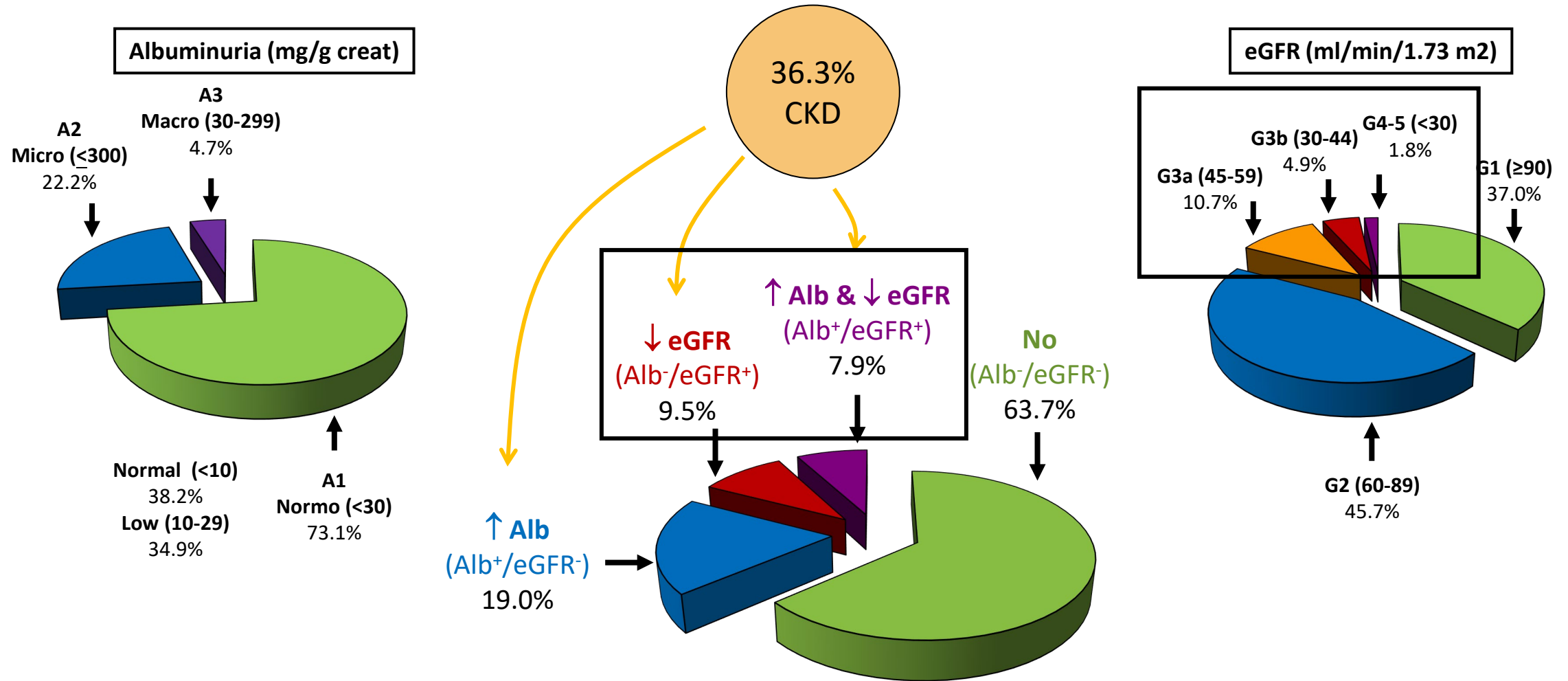
Age: 66.0 ± 10.3 years (median 67 years)

Sex: 56.8% male and 43.2% female

Diabetes duration: 13.2 ± 10.2 years (median 11 years)

# The Renal Insufficiency And Cardiovascular Events (**RIACE**) Italian Multicentre Study

## Clinical significance of **nonalbuminuric renal impairment** in type 2 diabetes



# The Renal Insufficiency And Cardiovascular Events (**RIACE**) Italian Multicentre Study

## Clinical significance of **nonalbuminuric renal impairment** in type 2 diabetes

|                              |              | No                                  | ↑ Alb                               | ↓ eGFR                              | ↑ Alb & ↓ eGFR                      |          |
|------------------------------|--------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------|
| Variable                     | Overall      | Alb <sup>-</sup> /eGFR <sup>-</sup> | Alb <sup>+</sup> /eGFR <sup>-</sup> | Alb <sup>-</sup> /eGFR <sup>+</sup> | Alb <sup>+</sup> /eGFR <sup>+</sup> | <i>p</i> |
| <i>n</i> (%)                 | 15,656 (100) | 9984 (63.77)                        | 2966 (18.94)                        | 1476 (9.43)                         | 1230 (7.86)                         |          |
| Age, years                   | 66.6 ± 10.3  | 64.8 ± 10.0                         | 66.0 ± 10.1                         | 74.4 ± 8.1                          | 73.2 ± 9.1                          | <0.0001  |
| Sex, <i>n</i> (%)            |              |                                     |                                     |                                     |                                     | <0.0001  |
| Female                       | 6754 (43.14) | 4510 (45.17)                        | 891 (30.04)                         | 889 (60.23)                         | 464 (37.72)                         |          |
| Male                         | 8902 (56.86) | 5474 (54.83)                        | 2075 (69.96)                        | 587 (39.77)                         | 766 (62.28)                         |          |
| Smoking status, <i>n</i> (%) |              |                                     |                                     |                                     |                                     | <0.0001  |
| Never                        | 8849 (56.52) | 5810 (58.19)                        | 1449 (48.85)                        | 935 (63.35)                         | 655 (53.25)                         |          |
| Former                       | 4407 (28.15) | 2644 (26.48)                        | 926 (31.22)                         | 417 (28.25)                         | 420 (34.15)                         |          |
| Current                      | 2400 (15.33) | 1530 (15.32)                        | 591 (19.93)                         | 124 (8.40)                          | 155 (12.60)                         |          |
| Diabetes duration, years     | 13.2 ± 10.2  | 11.9 ± 9.6                          | 13.8 ± 10.0                         | 16.4 ± 11.3                         | 18.3 ± 10.9                         | <0.0001  |
| HbA <sub>1c</sub> , mmol/mol | 59.0 ± 16.4  | 57.4 ± 15.4                         | 62.6 ± 18.3                         | 59.4 ± 15.8                         | 62.3 ± 18.8                         | <0.0001  |
| HbA <sub>1c</sub> , %        | 7.55 ± 1.50  | 7.40 ± 1.41                         | 7.88 ± 1.68                         | 7.58 ± 1.45                         | 7.85 ± 1.65                         |          |

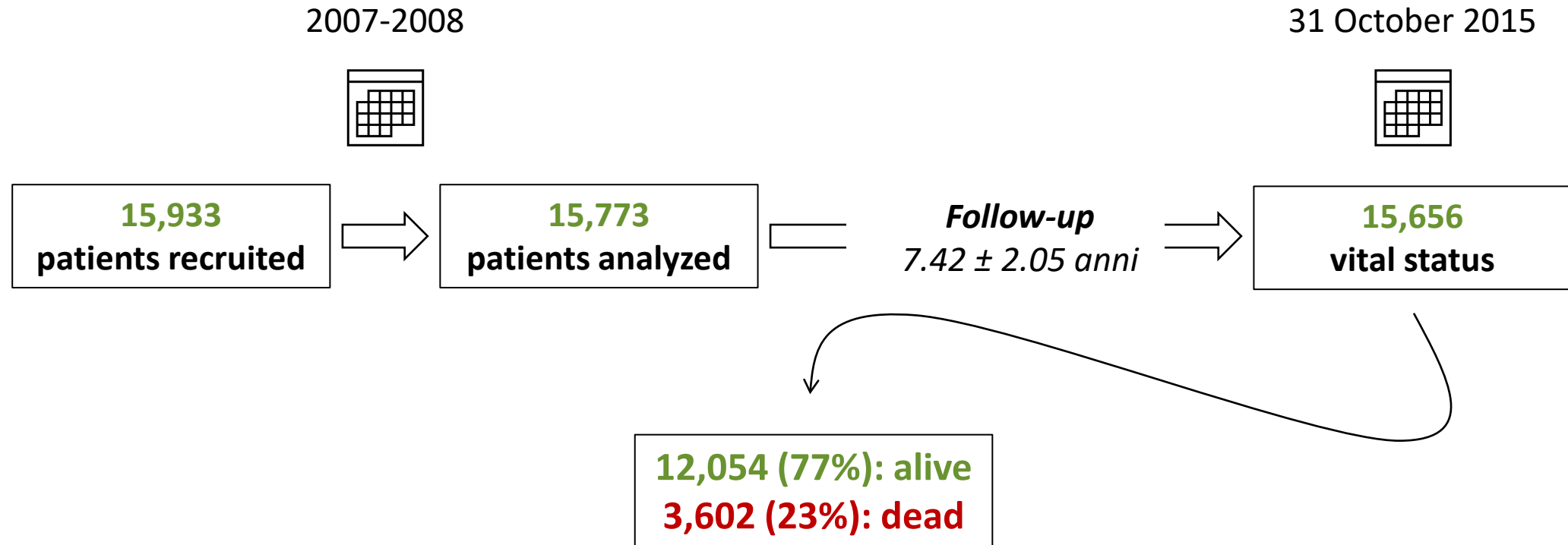
# The Renal Insufficiency And Cardiovascular Events (**RIACE**) Italian Multicentre Study

## Clinical significance of **nonalbuminuric renal impairment** in type 2 diabetes

| Variable                         | Overall        | No                                  | ↑ Alb                               | ↓ eGFR                              | ↑ Alb & ↓ eGFR                      | <i>p</i> |
|----------------------------------|----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------|
|                                  |                | Alb <sup>-</sup> /eGFR <sup>-</sup> | Alb <sup>+</sup> /eGFR <sup>-</sup> | Alb <sup>-</sup> /eGFR <sup>+</sup> | Alb <sup>+</sup> /eGFR <sup>+</sup> |          |
| Anti-hypertensive therapy, n (%) | 11,072 (70.72) | 6347 (63.57)                        | 2339 (78.86)                        | 1270 (86.04)                        | 1116 (90.73)                        | <0.0001  |
| RAS blockers, n (%)              | 9340 (59.66)   | 5258 (52.66)                        | 2051 (69.15)                        | 1072 (72.63)                        | 959 (77.97)                         | <0.0001  |
| Hypertension, n (%)              | 13,096 (83.65) | 7906 (79.19)                        | 2650 (89.35)                        | 1371 (92.89)                        | 1169 (95.04)                        | <0.0001  |
| Diabetic retinopathy, n (%)      |                |                                     |                                     |                                     |                                     | <0.0001  |
| No                               | 12,189 (77.86) | 8273 (82.86)                        | 2072 (69.86)                        | 1129 (76.49)                        | 715 (58.13)                         |          |
| Non-advanced                     | 1947 (12.44)   | 1065 (10.67)                        | 447 (15.07)                         | 195 (13.21)                         | 240 (19.51)                         |          |
| Advanced                         | 1520 (9.71)    | 646 (6.47)                          | 447 (15.07)                         | 152 (10.30)                         | 275 (22.36)                         |          |
| CVD, n (%)                       |                |                                     |                                     |                                     |                                     |          |
| Any                              | 3620 (23.12)   | 1770 (17.73)                        | 793 (26.74)                         | 495 (33.54)                         | 562 (45.69)                         | <0.0001  |
| Acute myocardial infarction      | 1742 (11.13)   | 880 (8.81)                          | 344 (11.60)                         | 258 (17.48)                         | 260 (21.14)                         | <0.0001  |
| Coronary revascularisation       | 1579 (10.09)   | 809 (8.10)                          | 320 (10.79)                         | 230 (15.58)                         | 220 (17.89)                         | <0.0001  |
| Any coronary event               | 2396 (15.30)   | 1218 (12.20)                        | 478 (16.12)                         | 351 (23.78)                         | 349 (28.37)                         | <0.0001  |
| Stroke                           | 513 (3.28)     | 231 (2.31)                          | 123 (4.15)                          | 70 (4.74)                           | 89 (7.24)                           | <0.0001  |
| Carotid revascularisation        | 856 (5.47)     | 370 (3.71)                          | 191 (6.44)                          | 129 (8.74)                          | 166 (13.50)                         | <0.0001  |
| Any cerebrovascular event        | 1292 (8.25)    | 573 (5.74)                          | 296 (9.98)                          | 187 (12.67)                         | 236 (19.19)                         | <0.0001  |
| Ulcer/gangrene/amputation        | 556 (3.55)     | 197 (1.97)                          | 164 (5.53)                          | 70 (4.74)                           | 125 (10.16)                         | <0.0001  |
| Lower limb revascularisation     | 450 (2.87)     | 178 (1.78)                          | 102 (3.44)                          | 68 (4.61)                           | 102 (8.29)                          | <0.0001  |

# The Renal Insufficiency And Cardiovascular Events (**RIACE**) Italian Multicentre Study

Non-albuminuric renal impairment is a **strong predictor of mortality** in individuals with T2D



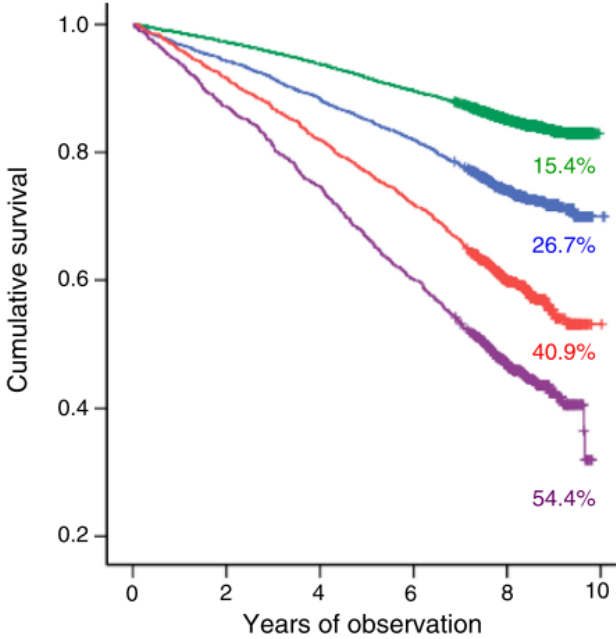
**Death rate 31.0 per 1000 person-years**

# The Renal Insufficiency And Cardiovascular Events (RIACE) Italian Multicentre Study

Non-albuminuric renal impairment is a **strong predictor of mortality** in individuals with T2D

**Table 2** Mortality rates according to DKD phenotype and KDIGO risk category and subcategory

| Characteristic                                     | <i>n</i> | Events | Per cent events | Events per 1000 person-years (95% CI), unadjusted | <i>p</i> |
|----------------------------------------------------|----------|--------|-----------------|---------------------------------------------------|----------|
| DKD phenotype                                      |          |        |                 |                                                   | <0.0001  |
| No Alb <sup>-</sup> /eGFR <sup>-</sup>             | 9984     | 1536   | 15.38           | 19.87 (18.87, 20.86)                              |          |
| ↑ Alb Alb <sup>+</sup> /eGFR <sup>-</sup>          | 2966     | 793    | 26.74           | 36.79 (34.23, 39.35)                              |          |
| ↓ eGFR Alb <sup>-</sup> /eGFR <sup>+</sup>         | 1476     | 604    | 40.92           | 61.49 (56.59, 66.40)                              |          |
| ↑ Alb & ↓ eGFR Alb <sup>+</sup> /eGFR <sup>+</sup> | 1230     | 669    | 54.39           | 90.25 (83.41, 97.08)                              |          |



ORIGINAL ARTICLE

**Haemoglobin A1c variability is a strong, independent predictor of all-cause mortality in patients with type 2 diabetes**

Orsi E et al. Diabetes Obes Metab 2018

ORIGINAL INVESTIGATION

Open Access

**Independent association of atherogenic dyslipidaemia with all-cause mortality in individuals with type 2 diabetes and modifying effect of gender: a prospective cohort study**

Orsi E et al. Cardiovasc Diabetol 2021

RESEARCH ARTICLE

Open Access

**Is resistant hypertension an independent predictor of all-cause mortality in individuals with type 2 diabetes? A prospective cohort study**

Solini A et al. BMC Medicine 2019



RESEARCH

Open Access

**Body mass index versus surrogate measures of central adiposity as independent predictors of mortality in type 2 diabetes**

Orsi E et al. Cardiovasc Diabetol 2022



Open access

Original research

BMJ Open  
Diabetes  
Research  
& Care

**Renal hyperfiltration is independently associated with increased all-cause mortality in individuals with type 2 diabetes: a prospective cohort study**

Penno G et al. BMJ Open Diab Res Care 2020

RESEARCH ARTICLE

Open Access

**Insulin resistance, diabetic kidney disease, and all-cause mortality in individuals with type 2 diabetes: a prospective cohort study**

Penno G et al. BMC Medicine 2021



ORIGINAL ARTICLE

**Risk of all-cause mortality according to the European Society of Cardiology risk categories in individuals with type 2 diabetes: the Renal Insufficiency And Cardiovascular Events (RIACE) Italian Multicenter Study**

Orsi E et al. Acta Diabetol 2022



Original article

**Retinopathy as an independent predictor of all-cause mortality in individuals with type 2 diabetes**

Orsi E et al. Diabetes Metab 2023



RESEARCH

Open Access



# Independent association of history of diabetic foot with all-cause mortality in patients with type 2 diabetes: the Renal Insufficiency And Cardiovascular Events (RIACE) Italian Multicenter Study

Martina Vitale<sup>1</sup>, Emanuela Orsi<sup>2</sup>, Anna Solini<sup>3</sup>, Monia Garofolo<sup>4</sup>, Veronica Resi<sup>2</sup>, Enzo Bonora<sup>5</sup>, Cecilia Fondelli<sup>6</sup>, Roberto Trevisan<sup>7</sup>, Monica Vedovato<sup>8</sup>, Giuseppe Penno<sup>4</sup> and Giuseppe Pugliese<sup>1\*</sup>

# Independent association of **history of diabetic foot** with all-cause mortality in patients with type 2 diabetes

**Table 1** Baseline clinical features of study participants by history of diabetic foot

| Variables                    | History of diabetic foot |            |
|------------------------------|--------------------------|------------|
|                              | No                       | Yes        |
| N (%)                        | 14,878 (94.3)            | 895 (5.7)  |
| Ulcer/gangrene               | –                        | 532 (59.4) |
| Amputation                   | –                        | 153 (17.1) |
| Minor                        | –                        | 129 (14.4) |
| Major                        | –                        | 24 (2.7)   |
| Ulcer/gangrene/amputation    | –                        | 565 (63.1) |
| Lower limb revascularization | –                        | 456 (50.9) |
| Endovascular                 | –                        | 192 (21.5) |
| Surgical                     | –                        | 245 (27.4) |
| Both                         | –                        | 19 (2.1)   |

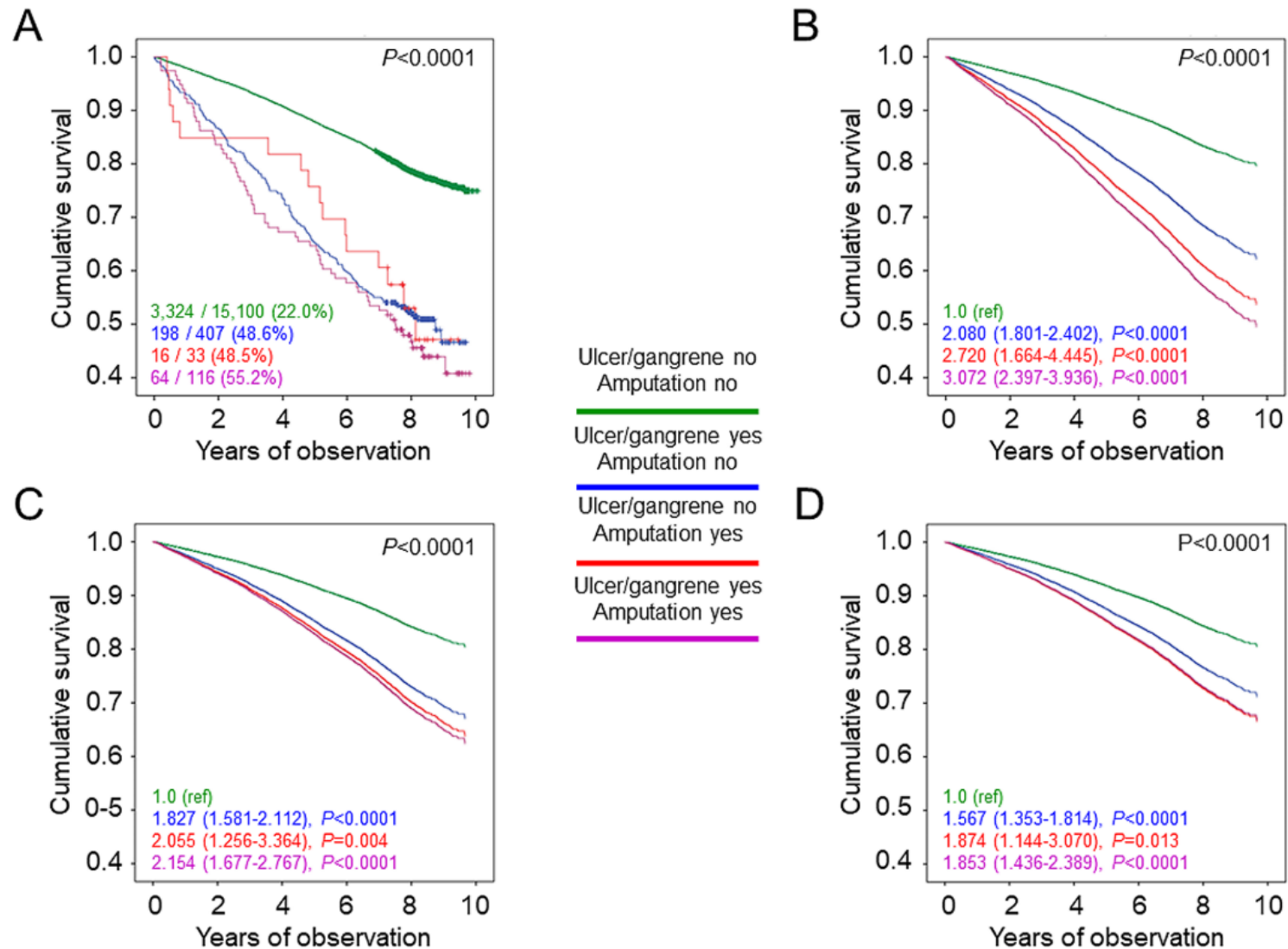
## Independent association of **history of diabetic foot** with all-cause mortality in patients with type 2 diabetes

**Table 2** Mortality rates in study participants by history of diabetic foot, ulcer/gangrene and/or amputation, and ulcer/gangrene/ amputation and/or lower limb revascularization

|                                       | N      | Events | Percent events | Events per 1,000 patient-years (95% CI), unadjusted | P        | Events per 1,000 patient-years (95% CI), age- & sex-adjusted | p        |
|---------------------------------------|--------|--------|----------------|-----------------------------------------------------|----------|--------------------------------------------------------------|----------|
| History of diabetic foot no           | 14,773 | 3,186  | 21.6           | 28.78 (27.80–29.80)                                 | Ref.     | 12.50 (11.10–14.09)                                          | Ref.     |
| History of diabetic foot yes          | 883    | 416    | 47.1           | 76.83 (69.79–84.58)                                 | < 0.0001 | 25.51 (21.84–29.79)                                          | < 0.0001 |
| Ulcer/gangrene no – Amputation no     | 15,100 | 3,324  | 22.0           | 29.47 (28.49–30.49)                                 | Ref.     | 12.53 (11.12–14.12)                                          | Ref.     |
| Ulcer/gangrene yes – Amputation no    | 407    | 198    | 48.6           | 81.27 (70.70–93.42)                                 | < 0.0001 | 25.05 (20.87–30.07)                                          | < 0.0001 |
| Ulcer/gangrene no – Amputation yes    | 33     | 16     | 48.5           | 77.46 (47.45–126.43)                                | 0.013    | 32.48 (19.59–53.84)                                          | 0.014    |
| Ulcer/gangrene yes – Amputation yes   | 116    | 64     | 55.2           | 94.01 (73.58–120.11)                                | < 0.0001 | 36.89 (27.96–48.67)                                          | < 0.0001 |
| Ulcer/gangrene/amput no – Revasc no   | 14,773 | 3,186  | 21.6           | 28.78 (27.80–29.80)                                 | Ref.     | 12.50 (11.10–14.09)                                          | Ref.     |
| Ulcer/gangrene/amput yes – Revasc no  | 433    | 203    | 46.9           | 76.23 (66.43–87.47)                                 | < 0.0001 | 26.31 (21.95–31.54)                                          | < 0.0001 |
| Ulcer/gangrene/amput no – Revasc yes  | 327    | 138    | 42.2           | 66.01 (55.87–78.00)                                 | < 0.0001 | 21.74 (17.65–26.78)                                          | < 0.0001 |
| Ulcer/gangrene/amput yes – Revasc yes | 123    | 75     | 61.0           | 113.50 (90.51–142.33)                               | < 0.0001 | 33.46 (25.80–43.39)                                          | < 0.0001 |

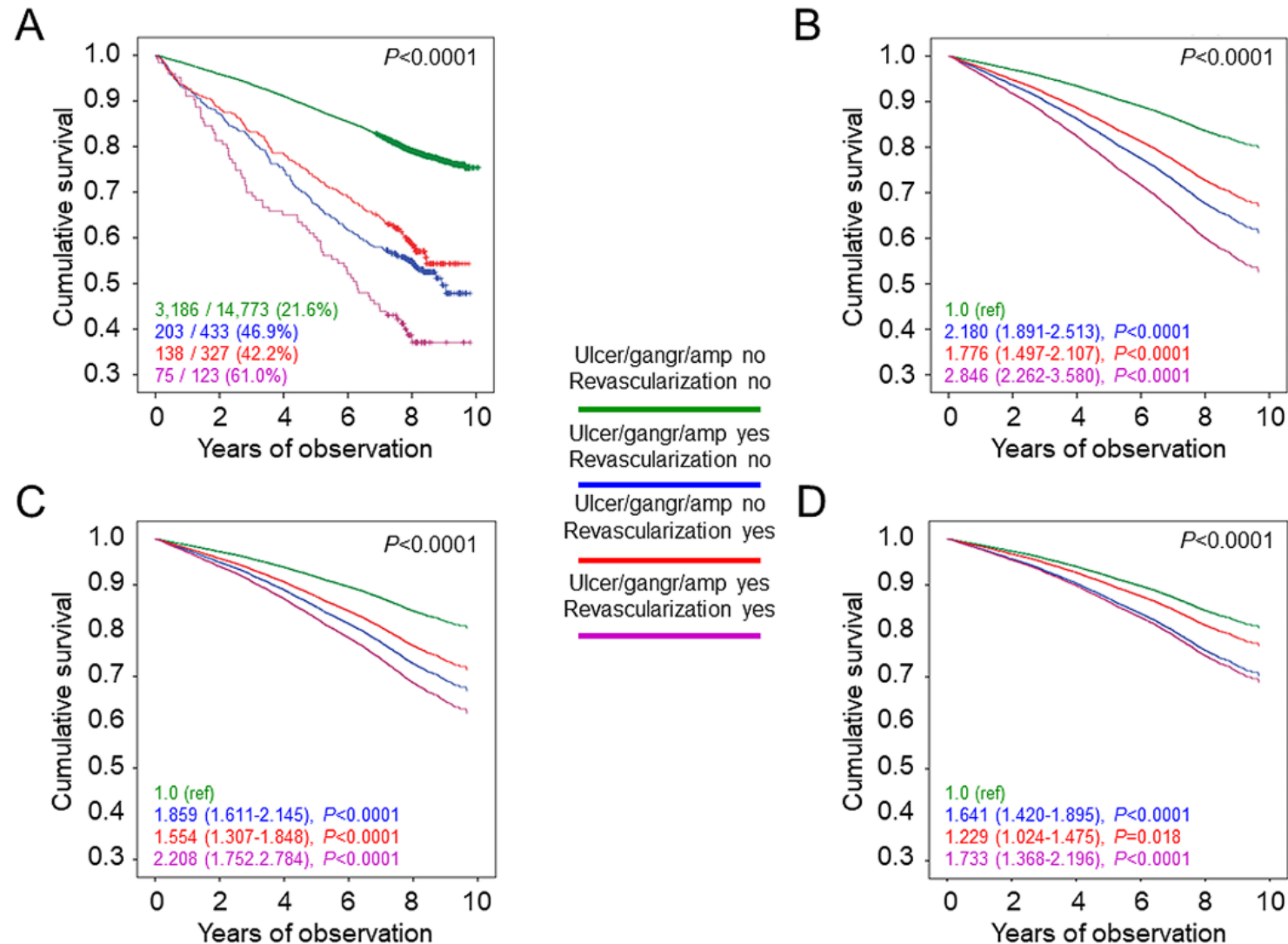
CI=confidence interval

# Independent association of **history of diabetic foot** with all-cause mortality in patients with type 2 diabetes

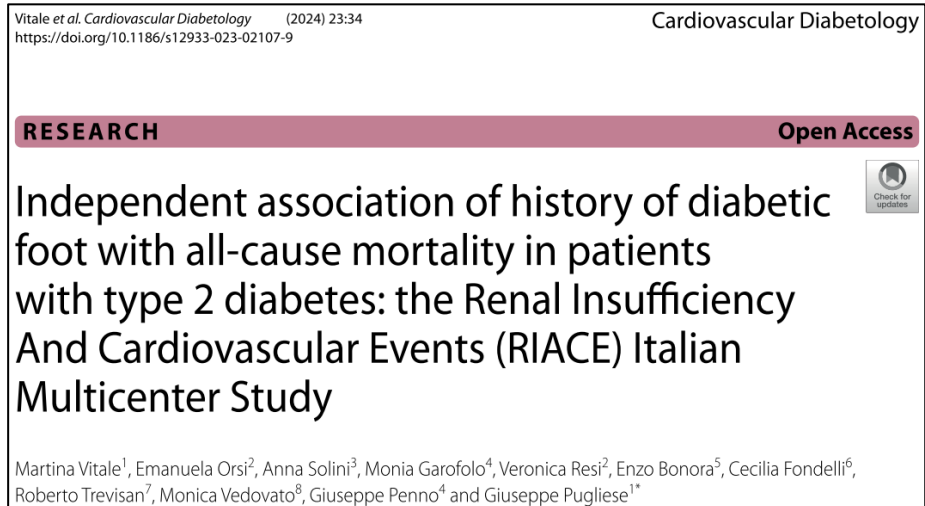


Kaplan-Meier analysis (**A**) and Cox proportional hazards regression, adjusted for age and sex (**B**), plus cardiovascular risk factors (**C**), plus complications and comorbidities (**D**)

# Independent association of **history of diabetic foot** with all-cause mortality in patients with type 2 diabetes



Kaplan-Meier analysis (**A**) and Cox proportional hazards regression, adjusted for age and sex (**B**), plus cardiovascular risk factors (**C**), plus complications and comorbidities (**D**)



## TAKE HOME MESSAGES - 1

- In patients with type 2 diabetes from the RIACE cohort, an **history of diabetic foot event**, including ulcer/gangrene, amputation, and lower limb revascularization, was associated with a **~ 50% increased risk** of subsequent death from any cause, **independent** of CVD risk factors, other complications and severe comorbidities
- The association with mortality was greatest for **amputation**
- The impact of **revascularization** alone was relatively modest



*QJM: An International Journal of Medicine*, 2024, **117(7)**, 495–502

<https://doi.org/10.1093/qjmed/hcae012>

Advance Access Publication Date: 10 January 2024

**Original Article**

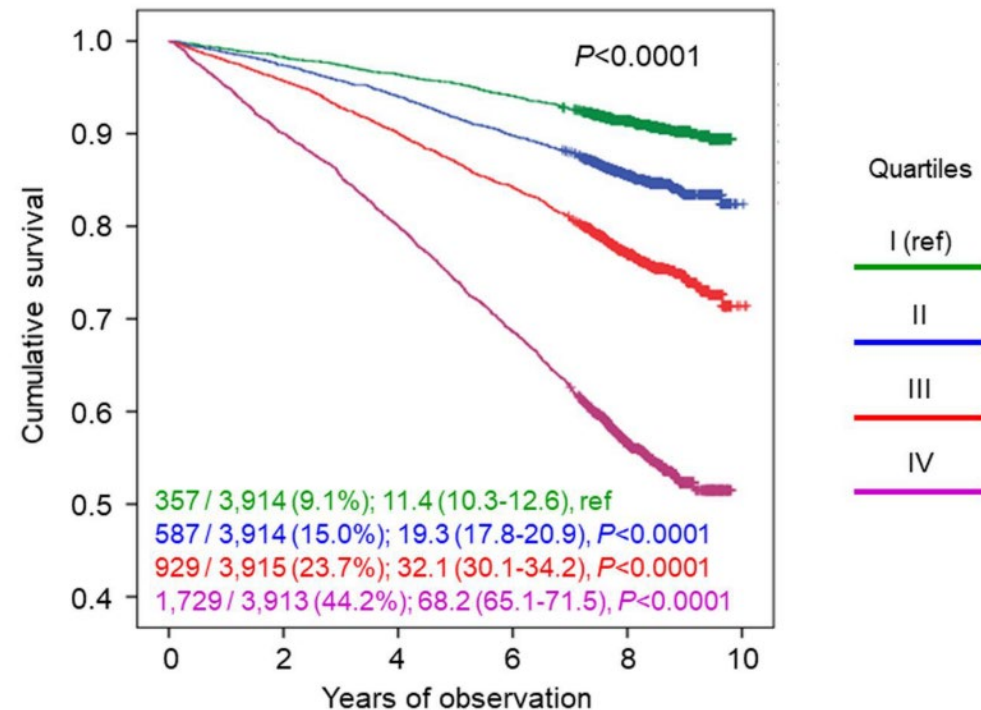
# Independent association of estimated pulse-wave velocity with all-cause mortality in individuals with type 2 diabetes

A. Solini <sup>1</sup>, E. Orsi<sup>2</sup>, M. Vitale<sup>3</sup>, M. Garofolo<sup>4</sup>, V. Resi<sup>2</sup>, E. Bonora<sup>5</sup>, C. Fondelli<sup>6</sup>, R. Trevisan<sup>7</sup>, M. Vedovato<sup>8</sup>, A. Nicolucci<sup>9</sup>, G. Penno<sup>4</sup> and G. Pugliese <sup>3,\*</sup>, for the Renal Insufficiency And Cardiovascular Events (RIACE) Study Group<sup>†</sup>

# Independent association of **estimated pulse-wave velocity** with all-cause mortality in individuals with type 2 diabetes

**Table 1.** Baseline clinical features of study participants by ePWV quartiles

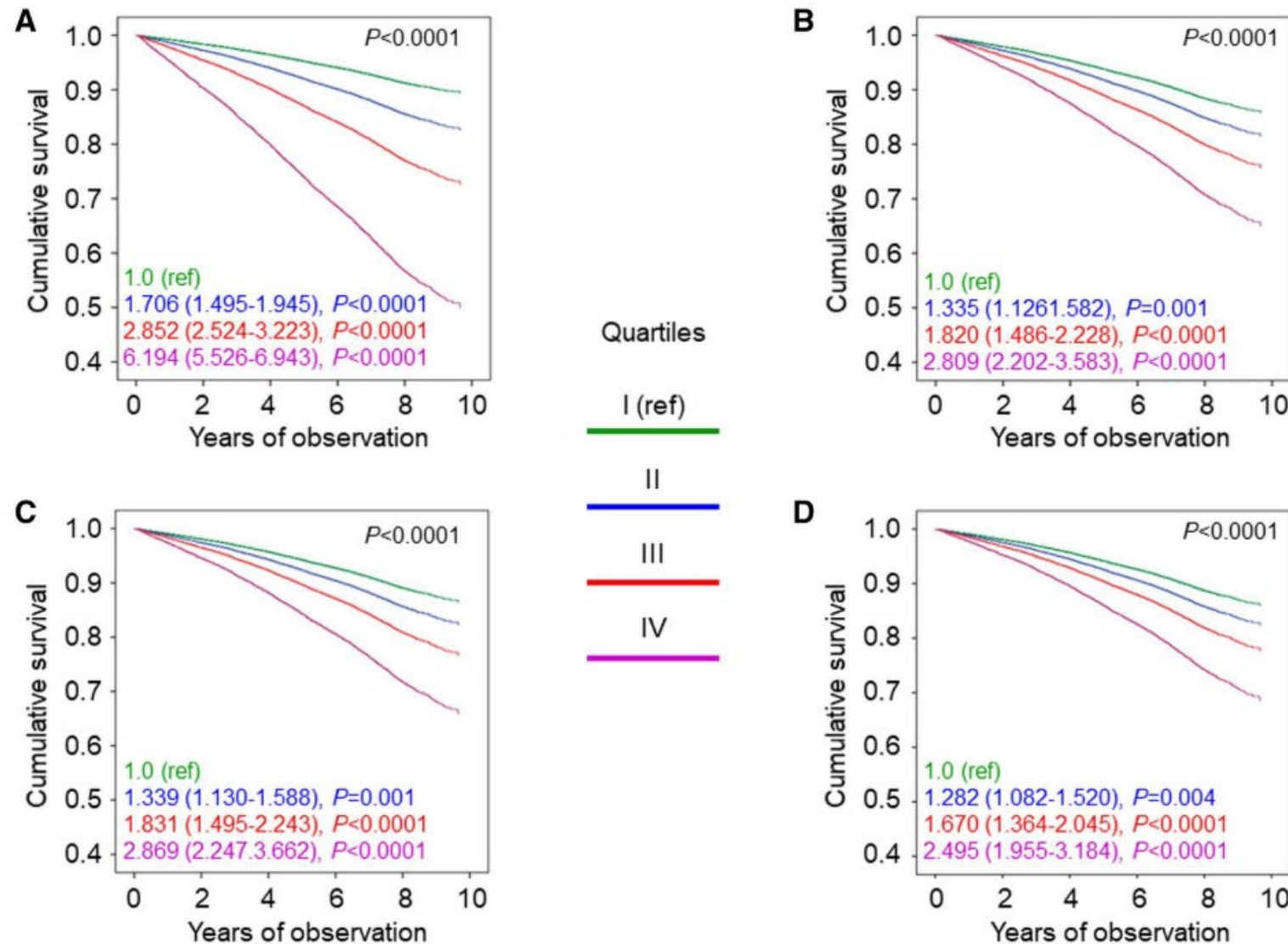
| Variables               | I           | II           | III           | IV            | P       |
|-------------------------|-------------|--------------|---------------|---------------|---------|
| N (%)                   | 3914        | 3914         | 3915          | 3913          |         |
| ePWV, m·s <sup>-1</sup> | 8.37 ± 0.81 | 10.12 ± 0.37 | 11.40 ± 0.40  | 13.33 ± 0.98  |         |
| (range)                 | (4.89–9.45) | (9.46–10.74) | (10.74–12.13) | (12.13–19.74) |         |
| Deaths, n (%)           | 357 (9.1)   | 587 (15.0)   | 929 (23.7)    | 1729 (44.2)   | <0.0001 |



Kaplan–Meier analysis according to ePWV quartiles.

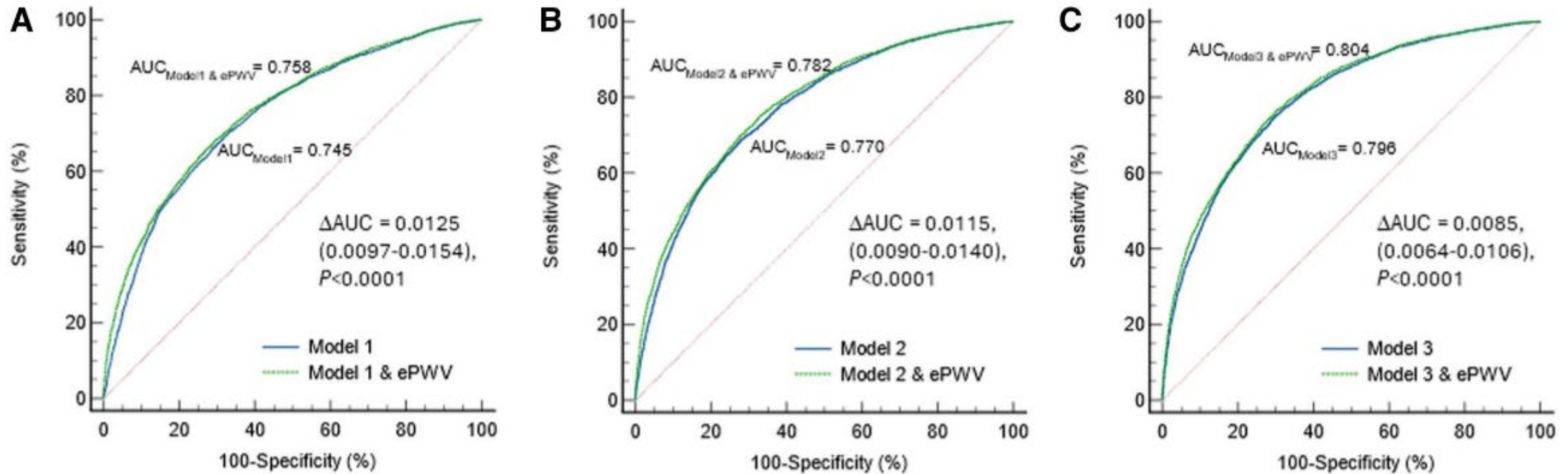
Number and percentage of deaths, death rates as events per 1000 patient-years (95% CI)

# Independent association of **estimated pulse-wave velocity** with all-cause mortality in individuals with type 2 diabetes



Cox proportional hazards regression, unadjusted (**A**) adjusted for sex, age, BP (**B**), plus other CVD risk factors (**C**), plus complications and comorbidities (**D**)

# Independent association of **estimated pulse-wave velocity** with all-cause mortality in individuals with type 2 diabetes



Marginal improvement provided by ePWV in the prediction of all-cause death over sex, age, BP (**A, Model 1**), plus other CVD risk factors (**B, Model 2**), plus complications and comorbidities (**C, Model 3**)

## Independent association of estimated pulse-wave velocity with all-cause mortality in individuals with type 2 diabetes

A. Solini<sup>1</sup>, E. Orsi<sup>2</sup>, M. Vitale<sup>3</sup>, M. Garofolo<sup>4</sup>, V. Resi<sup>2</sup>, E. Bonora<sup>5</sup>, C. Fondelli<sup>6</sup>, R. Trevisan<sup>7</sup>, M. Vedovato<sup>8</sup>, A. Nicolucci<sup>9</sup>, G. Penno<sup>4</sup> and G. Pugliese<sup>3,\*</sup>, for the Renal Insufficiency And Cardiovascular Events (RIACE) Study Group<sup>†</sup>

## TAKE HOME MESSAGES - 2

- This analysis of the RIACE cohort of individuals with type 2 diabetes shows that **ePWV** is **associated** with all-cause mortality **independently** of complications, comorbidities and traditional CVD risk factors
- ePWV improved **prediction** of mortality risk over CVD risk factors, complications and comorbidities, though the net difference was modest
- ePWV may represent a **simple and inexpensive tool** for risk stratification of diabetic patients and identification of those who deserve a more aggressive treatment

ORIGINAL ARTICLE



# Association between age at diagnosis and all-cause mortality in type 2 diabetes: the Renal Insufficiency and Cardiovascular Events (RIACE) Italian Multicenter Study

Martina Vitale<sup>1</sup> · Emanuela Orsi<sup>2</sup> · Anna Solini<sup>3</sup> · Monia Garofolo<sup>4</sup> · Valeria Grancini<sup>2</sup> · Enzo Bonora<sup>5</sup> · Cecilia Fondelli<sup>6</sup> · Roberto Trevisan<sup>7</sup> · Monica Vedovato<sup>8</sup> · Giuseppe Penno<sup>4</sup> · Antonio Nicolucci<sup>9</sup> · Giuseppe Pugliese<sup>1</sup>  · for the Renal Insufficiency And Cardiovascular Events (RIACE) Study Group\*

## Association between **age at diagnosis** and all-cause mortality in type 2 diabetes

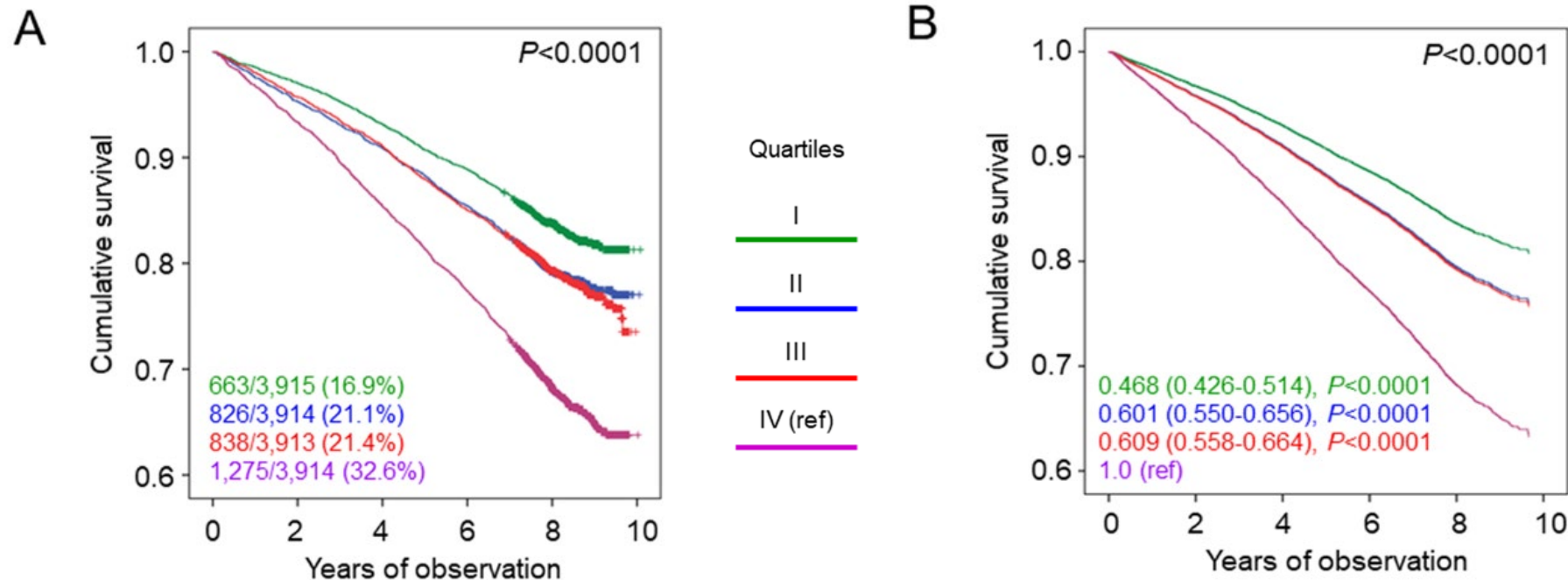
**Table 1** Baseline clinical features of study participants by quartiles of age at type 2 diabetes diagnosis

| Variables                                          | I                       | II                      | III                     | IV                      | <i>P</i> |
|----------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------|
| N (%)                                              | 3915                    | 3914                    | 3913                    | 3914                    |          |
| Age at type 2 diabetes diagnosis, years<br>(range) | 39.6±4.7<br>(20.5–45.9) | 49.8±2.2<br>(45.9–53.5) | 57.2±2.2<br>(53.5–61.2) | 67.8±5.3<br>(61.2–93.5) |          |
| Age, years                                         | 59.5±11.3               | 65.0±9.5                | 67.7±7.5                | 74.2±6.3                | <0.0001  |
| Diabetes duration, years                           | 19.8±10.3               | 15.1±9.6                | 10.6±7.5                | 6.5±5.3                 | <0.0001  |

# Association between **age at diagnosis** and all-cause mortality in type 2 diabetes

**Table 3** Mortality rates in study participants by quartiles of age at type 2 diabetes diagnosis

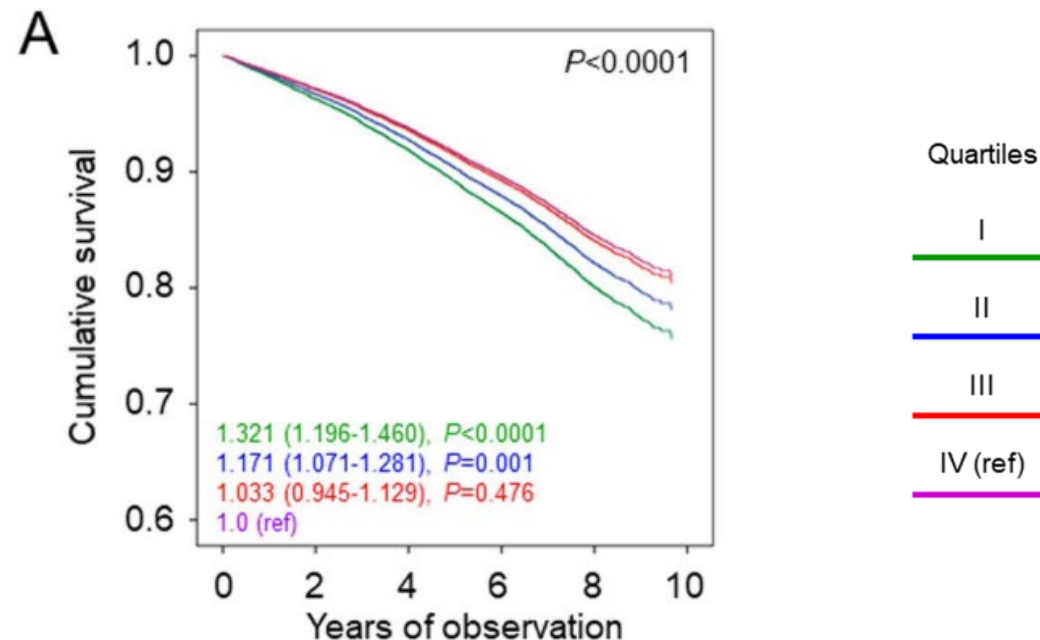
| Quartile | N     | Events | Percent events | Events per 1,000 patient-years (95% CI), unadjusted | <i>P</i> |
|----------|-------|--------|----------------|-----------------------------------------------------|----------|
| I        | 3,915 | 663    | 16.9           | 22.03 (20.41–23.77)                                 | Ref      |
| II       | 3,914 | 826    | 21.1           | 28.22 (26.36–30.21)                                 | < 0.0001 |
| III      | 3,913 | 838    | 21.4           | 28.57 (26.70–30.57)                                 | < 0.0001 |
| IV       | 3,914 | 1,275  | 32.6           | 46.54 (44.06–49.17)                                 | < 0.0001 |



# Association between **age at diagnosis** and all-cause mortality in type 2 diabetes

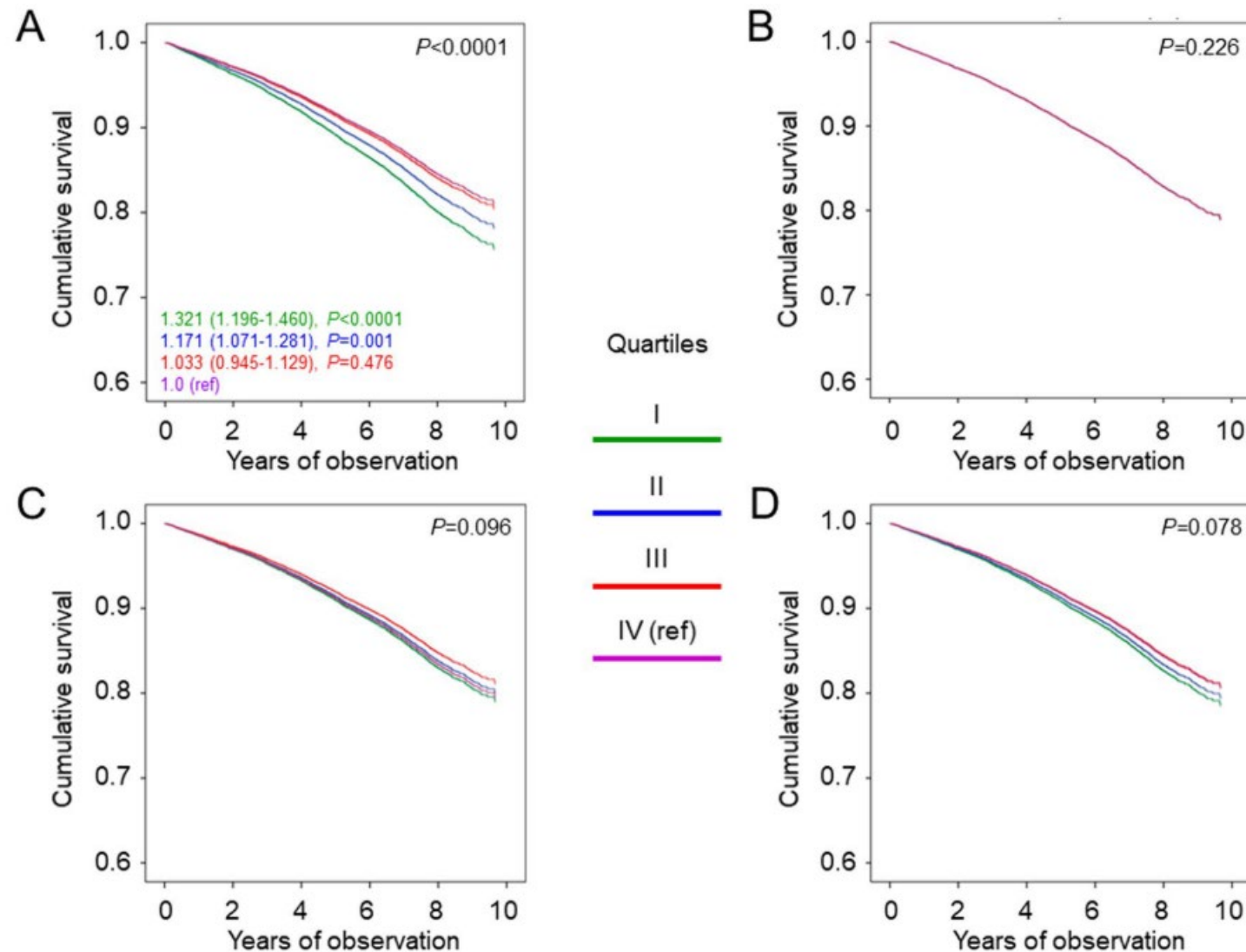
**Table 3** Mortality rates in study participants by quartiles of age at type 2 diabetes diagnosis

| Quartile | N     | Events | Percent events | Events per 1,000 patient-years (95% CI), unadjusted | <i>P</i> | Events per 1,000 patient-years (95% CI), age- & sex-adjusted | <i>P</i> |
|----------|-------|--------|----------------|-----------------------------------------------------|----------|--------------------------------------------------------------|----------|
| I        | 3,915 | 663    | 16.9           | 22.03 (20.41–23.77)                                 | Ref      | 14.98 (13.07–17.18)                                          | Ref      |
| II       | 3,914 | 826    | 21.1           | 28.22 (26.36–30.21)                                 | <0.0001  | 13.28 (11.64–15.15)                                          | 0.023    |
| III      | 3,913 | 838    | 21.4           | 28.57 (26.70–30.57)                                 | <0.0001  | 11.74 (10.29–13.40)                                          | <0.0001  |
| IV       | 3,914 | 1,275  | 32.6           | 46.54 (44.06–49.17)                                 | <0.0001  | 11.40 (9.99–13.00)                                           | <0.0001  |



Cox proportional hazards regression, adjusted for sex, age (**A**)

# Association between **age at diagnosis** and all-cause mortality in type 2 diabetes



Cox proportional hazards regression, adjusted for sex, age (A), plus diabetes duration (B), plus other risk factors (C), plus complications and comorbidities (D)



## Association between age at diagnosis and all-cause mortality in type 2 diabetes: the Renal Insufficiency and Cardiovascular Events (RIACE) Italian Multicenter Study

Martina Vitale<sup>1</sup> · Emanuela Orsi<sup>2</sup> · Anna Solini<sup>3</sup> · Monia Garofolo<sup>4</sup> · Valeria Grancini<sup>2</sup> · Enzo Bonora<sup>5</sup> · Cecilia Fondelli<sup>6</sup> · Roberto Trevisan<sup>7</sup> · Monica Vedovato<sup>8</sup> · Giuseppe Penno<sup>4</sup> · Antonio Nicolucci<sup>9</sup> · Giuseppe Pugliese<sup>1</sup> · for the Renal Insufficiency And Cardiovascular Events (RIACE) Study Group\*

## TAKE HOME MESSAGES - 3

- This analysis of the RIACE cohort showed that type 2 diabetes diagnosed in **early adulthood** was **associated with higher age- and sex-adjusted risk** of all-cause death than that occurring later in life
- However, **no difference** was observed when further **adjusting for diabetes duration** or complications/comorbidities
- These data point to the need for **public health policies and tailored guidelines** for **preventing and treating** early-onset type 2 diabetes to avoid premature morbidity and mortality from complications.

# The RIACE Study Group



## The RIACE Steering Committee

**Coordinator: Giuseppe Pugliese**

**Secretary: Giuseppe Penno**

**Scientific committee: Anna Solini, Enzo Bonora, Emanuela Orsi, Roberto Trevisan, Luigi Laviola, Antonio Nicolucci**

## Participating Diabetes Centres

1. Azienda Ospedaliera Sant'Andrea, Roma (Coordinating Centre): Giuseppe Pugliese, Lucilla Bollanti, Elena Alessi, Martina Vitale, and Tiziana Cirrito.
2. Ospedale Le Molinette, Torino: Paolo Cavallo-Perin, Gabriella Gruden, and Bartolomeo Lorenzati.
3. Ospedale San Luigi Gonzaga, Orbassano: Franco Cavalot, Mariella Trovati, Leonardo Di Martino, and Fabio Mazzaglia.
4. Ospedale San Raffaele, Milano: Giampaolo Zerbini, Valentina Martina, Silvia Maestroni, and Valentina Capuano.
5. IRCCS "Cà Granda – Ospedale Maggiore Policlinico", Milano: Emanuela Orsi, Eva Palmieri, Elena Lunati, Valeria Grancini, and Veronica Resi.
6. Ospedale San Paolo, Milano: Antonio Pontiroli, Annamaria Veronelli, and Barbara Zecchini.
7. Ospedale San Giuseppe, Milano: Maura Arosio, Laura Montefusco, and Guido Adda.
8. ASST - Ospedale Papa Giovanni XXIII, Bergamo: Roberto Trevisan, Anna Corsi, and Mascia Albizzi.
9. Ospedale Maggiore, Verona: Enzo Bonora, and Giacomo Zoppini.
10. Policlinico Universitario, Padova: Angelo Avogaro, and Monica Vedovato.
11. Ospedale Cisanello, Azienda Ospedaliero-Universitaria Pisana, Pisa: Giuseppe Penno, Laura Pucci, Daniela Lucchesi, Eleonora Russo, and Monia Garofolo.
12. Ospedale Santa Chiara, Azienda Ospedaliero-Universitaria Pisana, Pisa: Anna Solini.
13. Ospedale Le Scotte, Siena: Francesco Dotta, Cecilia Fondelli, and Laura Nigi.
14. Policlinico Umberto I, Roma: Susanna Morano, Tiziana Filardi, Irene Turinese, and Marco Rossetti.
15. Ospedale S. Maria Goretti, Latina: Raffaella Buzzetti and Chiara Foffi.
16. Ospedali Riuniti, Foggia: Mauro Cignarelli, Olga Lamacchia, Sabina Pinnelli, and Lucia Monaco.
17. Policlinico Universitario, Bari: Francesco Giorgino, Luigi Laviola, and Annalisa Natalicchio.
18. Policlinico Mater Domini, Catanzaro: Giorgio Sesti and Francesco Andreozzi.
19. Policlinico Monserrato, Cagliari: Marco Giorgio Baroni, Giuseppina Frau, and Alessandra Boi.