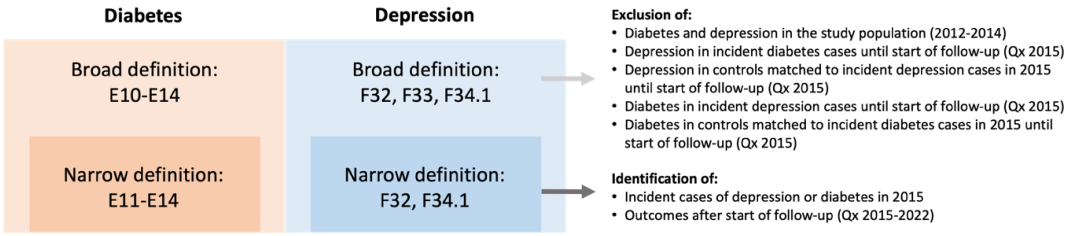
**Online-Only Supplemental Material**

| | |
|---|---|
| depression diagnosis (without censoring controls who changed their exposure status during follow-up). | |
| **Supplemental Figure 2:** Time-to-event curves for cases and controls, i.e. developing depression in the diabetes cohort and developing diabetes in the depression cohort, respectively, presented in the supplementary materials were depicted as inverse of the Kaplan-Meier survival curves. Mathematically, this can be expressed as 1-S(t), where S(t) is the proportion of event-free patients at time t. To present the result more clearly and simplify interpretation, the probability is shown as a percentage value between 0 and 100. | **Page 11** |




**Supplemental Figure 1:** Diagnostic lists used in the study, emphasizing the distinctions in ICD-10-GM codes for diabetes and depression.

**Supplemental Table 1:** Medical diseases included in the Charlson Comorbidity Index based on ICD-10-GM (only diagnoses documented as "assured" were considered).

| **Charlson Comorbidity index** | |
|---|---|
| Myocardial infarction | ICD-10: I21-I23 |
| Congestive Heart failure | ICD-10: I50, I11.0, I13.0, I13.2 |
| Peripheral vascular disease | ICD-10: I70-I74, I77 |
| Cerebrovascular disease | ICD-10: I60-I69, G45, G46 |
| Dementia | ICD-10: G30 |
| Chronic pulmonary disease | ICD-10: J40-J47, J60-J67, J68.4, J70.1, J70.3, J84.1, J92.0, J96.1, J98.2, J98.3 |
| Connective tissue disease | ICD-10: M05, M06, M08, M09, M30-M36, D86 |
| Ulcer disease | ICD-10: K22.1, K25-K28 |
| Mild liver disease | ICD-10: B18; K70.0-K70.3; K70.9; K71; K73; K74; K76.0 |
| Hemiplegia | ICD-10: G81, G82 |
| Moderate to severe renal disease | ICD-10: I12, I13, N00-N05, N07, N11, N14, N17-N19, Q61 |
| Any tumor | ICD-10: C00-C75 |
| Leukemia | ICD-10: C91-C95 |
| Lymphoma | ICD-10: C81-C85, C88, C90, C96 |
| Moderate to severe liver disease | ICD-10: B15.0, B16.0, B16.2, B19.0, K70.4, K72, K76.6, I85 |
| Metastatic solid tumor | ICD-10: C76-C80 |
| AIDS | ICD-10: B21-B24 |

**Supplemental Table 2:** Age distribution of total population, cases and controls of the cohorts.

| | | No. (%) | | | | |
|---|---|---|---|---|---|---|
| Variable | | Total | Diabetes-Cohort | | Depression-Cohort | |
| | | | Cases | Controls | Cases | Controls |
| Age groups | | | | | | |
| | 18-19 | 1,202,773 (3.3) | 696 (0.2) | 2,784 (0.2) | 33,767 (2.7) | 135,068 (2.7) |
| | 20-24 | 2,874,127 (7.9) | 2,181 (0.7) | 8,724 (0.7) | 91,433 (7.2) | 365,732 (7.2) |
| | 25-29 | 3,132,103 (8.6) | 3,771 (1.3) | 15,084 (1.3) | 107,113 (8.4) | 428,452 (8.4) |
| | 39-34 | 2,917,556 (8.0) | 5,644 (1.9) | 22,576 (1.9) | 107,179 (8.4) | 428,716 (8.4) |
| | 35-39 | 2,776,441 (7.6) | 8,943 (3.0) | 35,772 (3.0) | 105,360 (8.3) | 421,440 (8.3) |
| | 40-44 | 2,711,307 (7.5) | 12,203 (4.1) | 48,812 (4.1) | 103,450 (8.1) | 413,800 (8.1) |
| | 45-49 | 3,532,686 (9.7) | 21,743 (7.4) | 86,972 (7.4) | 134,241 (10.6) | 536,964 (10.6) |
| | 50-54 | 3,690,131 (10.2) | 32,070 (10.9) | 128,280 (10.9) | 143,941 (11.3) | 575,764 (11.3) |
| | 55-59 | 3,036,822 (8.4) | 35,713 (12.1) | 142,852 (12.1) | 117,884 (9.3) | 471,536 (9.3) |
| | 60-65 | 2,438,935 (6.7) | 36,041 (12.2) | 144,164 (12.2) | 81,186 (6.4) | 324,744 (6.4) |
| | 65-69 | 1,987,075 (5.5) | 34,526 (11.7) | 138,104 (11.7) | 50,436 (4.0) | 201,744 (4.0) |
| | 70-74 | 1,852,823 (5.1) | 31,799 (10.8) | 127,196 (10.8) | 52,375 (4.1) | 209,500 (4.1) |
| | 75-79 | 1,959,864 (5.4) | 34,984 (11.9) | 139,936 (11.9) | 61,494 (4.8) | 245,976 (4.8) |
| | 80-84 | 1,123,629 (3.1) | 19,867 (6.7) | 79,468 (6.7) | 39,936(3.1) | 159,744 (3.1) |
| | 85-89 | 688,543 (1.9) | 10,286 (3.5) | 41,144 (3.5) | 26,717 (2.1) | 106,868 (2.1) |
| | ≥90 | 379,607 (1.0) | 4,175 (1.4) | 16700 (1.4) | 15,025 (1.2) | 60,100 (1.2) |

**Supplemental Table 3:** Adjusted hazard ratios for the risk of developing depression in the following 8 years after incident type 2 diabetes diagnosis.

| | | Adjusted HR (99% CI) |
|---|---|---|
| Incident type 2 diabetes in 2015 | | 1.227 (1.212-1.243) |
| Charlson Comorbidity index | | |
| | 1 | 1.177 (1.162-1.192) |
| | ≥2 | 1.170 (1.153-1.186) |
| District types | | |
| | urban districts | 0.949 (0.896-1.006) |
| | rural area with population concentrations | 0.892 (0.839-0.949) |
| | rural area with low population density | 0.884 (0.830-0.943) |
| Deprivation index | | |
| | Low | 1.025 (0.963-1.090) |
| | Middle | 0.965 (0.906-1.028) |
| | high | 0.943 (0.886-1.004) |
| | highest | 0.899 (0.842-0.960) |

Hazard ratios (HR) were derived using Cox regression. Fixed effects accounted for chronic medical disease burden, urbanicity, and area-level deprivation, while a random effect was considered for the district of residence. Reference categories were: no chronic medical disease, residing in major urban municipalities, and the lowest area-level deprivation index. Note: This model's primary exposure is incident type 2 diabetes in 2015. The chosen covariates effectively control for confounding effects concerning this primary exposure. Secondary effect estimates of the covariates should not be seen as independent effects on depression, as a distinct set of covariates might be necessary for such interpretation.
Key: HR = hazard ratio; 99% CI = 99% confidence interval.

**Supplemental Table 4:** Adjusted hazard ratios for the risk of developing type 2 diabetes in the following 8 years after incident depression diagnosis.

| | | Adjusted HR (99% CI) |
|---|---|---|
| Incident depression in 2015 | | 1.153 (1.140-1.166) |
| Charlson Comorbidity index | | |
| | 1 | 1.630 (1.612-1.648) |
| | ≥2 | 2.324 (2.293-2.355) |
| District types | | |
| | urban districts | 1.025 (0.952-1.104) |
| | rural area with population concentrations | 1.059 (0.980-1.146) |
| | rural area with low population density | 1.060 (0.977-1.150) |
| Deprivation index | | |
| | Low | 1.056 (0.975-1.142) |
| | Middle | 1.113 (1.027-1.206) |
| | high | 1.281 (1.183-1.387) |
| | highest | 1.342 (1.235-1.459) |

Hazard ratios (HR) were derived using Cox regression. Fixed effects accounted for chronic medical disease burden, urbanicity, and area-level deprivation, while a random effect was considered for the district of residence. Reference categories were: no chronic medical disease, residing in major urban municipalities, and the lowest area-level deprivation index. Note: This model's primary exposure is incident depression in 2015. The chosen covariates effectively control for confounding effects concerning this primary exposure. Secondary effect estimates of the covariates should not be seen as independent effects on type 2 diabetes, as a distinct set of covariates might be necessary for such interpretation.
Key: HR = hazard ratio; 99% CI = 99% confidence interval.

**Supplemental Table 5:** Adjusted hazard ratios for the risk of developing type 2 diabetes in the following 8 years after incident depression diagnosis accounting for depression severity.

| | | Adjusted HR (99% CI) |
|---|---|---|
| Incident depression in 2015 | | |
| | Unspecified[1] | 1.162 (1.146-1.179) |
| | Mild | 1.133 (1.106-1.161) |
| | Moderate | 1.119 (1.094-1.144) |
| | Severe | 1.234 (1.188-1.281) |
| Charlson Comorbidity index | | |
| | 1 | 1.630 (1.612-1.648) |
| | ≥2 | 2.323 (2.292-2.354) |
| District types | | |
| | urban districts | 1.026 (0.952-1.104) |
| | rural area with population concentrations | 1.060 (0.980-1.146) |
| | rural area with low population density | 1.060 (0.977-1.151) |
| Deprivation index | | |
| | Low | 1.056 (0.976-1.143) |
| | Middle | 1.113 (1.027-1.206) |
| | high | 1.281 (1.183-1.387) |
| | highest | 1.342 (1.235-1.459) |

Hazard ratios (HR) were derived using Cox regression. Fixed effects accounted for chronic medical disease burden, urbanicity, and area-level deprivation, while a random effect was considered for the district of residence. Reference categories were: no chronic medical disease, residing in major urban municipalities, and the lowest area-level deprivation index. Note: This model's primary exposure is incident depression in 2015. The chosen covariates effectively control for confounding effects concerning this primary exposure. Secondary effect estimates of the covariates should not be seen as independent effects on type 2 diabetes, as a distinct set of covariates might be necessary for such interpretation.
[1]The unspecified depression severity level includes all patients with unknown or unspecific degree of severity. This category is included for completeness.
Key: HR = hazard ratio; 99% CI = 99% confidence interval.

**Supplemental Table 6:** Adjusted hazard ratios for the risk of developing depression in the following 8 years after incident type 2 diabetes diagnosis (without censoring controls who changed their exposure status during follow-up).

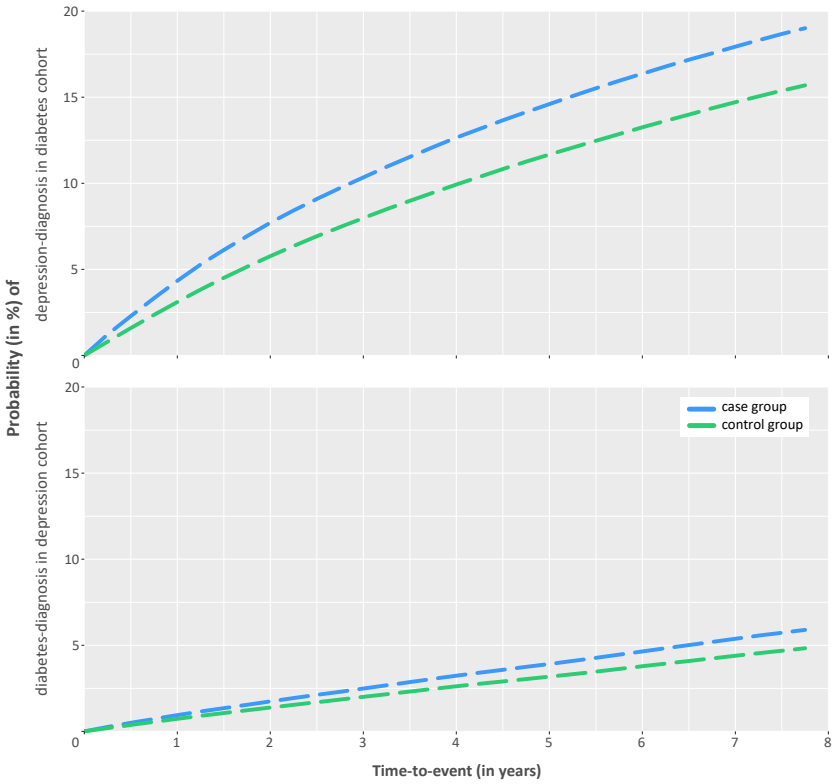
| | | Adjusted HR (99% CI) |
|---|---|---|
| Incident type 2 diabetes in 2015 | | 1.217 (1.202-1.232) |
| Charlson Comorbidity index | | |
| | 1 | 1.177 (1.162-1.191) |
| | ≥2 | 1.173 (1.157-1.190) |
| District types | | |
| | urban districts | 0.948 (0.895-1.004) |
| | rural area with population concentrations | 0.893 (0.840-0.949) |
| | rural area with low population density | 0.884 (0.829-0.942) |
| Deprivation index | | |
| | Low | 1.025 (0.963-1.090) |
| | Middle | 1.025 (0.963-1.090) |
| | high | 0.944 (0.887-1.005) |
| | highest | 0.898 (0.842-0.959) |

Hazard ratios (HR) were derived using Cox regression. Fixed effects accounted for chronic medical disease burden, urbanicity, and area-level deprivation, while a random effect was considered for the district of residence. Reference categories were: no chronic medical disease, residing in major urban municipalities, and the lowest area-level deprivation index. Note: This model's primary exposure is incident type 2 diabetes in 2015. The chosen covariates effectively control for confounding effects concerning this primary exposure. Secondary effect estimates of the covariates should not be seen as independent effects on depression, as a distinct set of covariates might be necessary for such interpretation.
Key: HR = hazard ratio; 99% CI = 99% confidence interval.

**Supplemental Table 7:** Adjusted hazard ratios for the risk of developing type 2 diabetes in the following 8 years after incident depression diagnosis (without censoring controls who changed their exposure status during follow-up).

| | | Adjusted HR (99% CI) |
|---|---|---|
| Incident depression in 2015 | | 1.133 (1.121-1.146) |
| Charlson Comorbidity index | | |
| | 1 | 1.625 (1.607-1.642) |
| | ≥2 | 2.304 (2.275-2.334) |
| District types | | |
| | urban districts | 1.024 (0.951-1.103) |
| | rural area with population concentrations | 1.056 (0.976-1.142) |
| | rural area with low population density | 1.058 (0.975-1.148) |
| Deprivation index | | |
| | Low | 1.054 (0.974-1.140) |
| | Middle | 1.110 (1.024-1.203) |
| | high | 1.273 (1.176-1.378) |
| | highest | 1.334 (1.227-1.450) |

Hazard ratios (HR) were derived using Cox regression. Fixed effects accounted for chronic medical disease burden, urbanicity, and area-level deprivation, while a random effect was considered for the district of residence. Reference categories were: no chronic medical disease, residing in major urban municipalities, and the lowest area-level deprivation index. Note: This model's primary exposure is incident depression in 2015. The chosen covariates effectively control for confounding effects concerning this primary exposure. Secondary effect estimates of the covariates should not be seen as independent effects on type 2 diabetes, as a distinct set of covariates might be necessary for such interpretation.
Key: HR = hazard ratio; 99% CI = 99% confidence interval.

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