Table S1. Coding Detail

| **Comorbidity** | **ICD-10 codes** |
|---|---|
| Myocardial Infarction | I21.x, I22.x, I25.2 |
| Congestive Heart Failure | I09.9, I11.0, I13.0, I13.2, I25.5, I42.0, I42.5-I42.9, I43.x, I50.x, P29.0 |
| Peripheral Vascular Disease | I70.x, I71.x, I73.1, I73.8, I73.9, I77.1, I79.0, I79.2, K55.1, K55.8, K55.9, Z95.8, Z95.9 |
| Cerebrovascular Disease | G45.x, G46.x, H34.0, I60.x–I69.x |
| Dementia | F00.x-F03.x, F05.1, G30.x, G31.1 |
| Chronic Pulmonary Disease | I27.8, I27.9, J40.x-J47.x, J60.x-J67.x, J68.4, J70.1, J70.3 |
| Rheumatic Disease | M05.x, M06.x, M31.5, M32.x–M34.x, M35.1, M35.3, M36.0 |
| Peptic Ulcer Disease | K25.x-K28.x |
| Mild Liver Disease | B18.x, K70.0-K70.3, K70.9, K71.3-K71.5, K71.7, K73.x, K74.x, K76.0, K76.2-K76.4, K76.8, K76.9, Z94.4 |
| Diabetes without complications | E10.0, E10.1, E10.6, E10.8, E10.9, E11.0, E11.1, E11.6, E11.8, E11.9, E12.0, E12.1, E12.6, E12.8, E12.9, E13.0, E13.1, E13.6, E13.8, E13.9, E14.0, E14.1, E14.6, E14.8, E14.9 |
| Diabetes with chronic complications | E10.2-E10.5, E10.7, E11.2-E11.5, E11.7, E12.2-E12.5, E12.7, E13.2-E13.5, E13.7, E14.2-E14.5, E14.7 |
| Paraplegia and Hemiplegia | G04.1, G11.4, G80.1, G80.2, G81.x, G82.x, G83.0–G83.4, G83.9 |
| Renal Disease | I12.0, I13.1, N03.2–N03.7, N05.2–N05.7, N18.x, N19.x, N25.0, Z49.0–Z49.2, Z94.0, Z99.2 |
| Cancer | C00.x–C26.x, C30.x–C34.x, C37.x–C41.x, C43.x, C45.x–C58.x, C60.x–C76.x, C81.x–C85.x, C88.x, C90.x–C97.x |
| Moderate or Severe Liver Disease | I85.0, I85.9, I86.4, I98.2, K70.4, K71.1, K72.1, K72.9, K76.5, K76.6, K76.7 |
| Metastatic Carcinoma | C77.x-C80.x |
| AIDS/HIV | B20.x-B22.x, B24.x |

Table S2. Geographic composition of the study regions

| Geographic group | No. of districts | Districts |
|---|---|---|
| Sanzhi | 1 | Sanzhi |
| Wan-Jin-Shi | 3 | Wanli, Jinshan, Shimen |
| Other excluded remote areas | 7 | Sanxia, Pinglin, Shuangxi, Shiding, Pingxi, Gongliao, Wulai |
| Reference area | 18 | Banqiao, Sanchong, Zhonghe, Yonghe, Xinzhuang, Xindian, Tucheng, Luzhou, Xizhi, Shulin, Yingge, Tamsui, Ruifang, Wugu, Taishan, Linkou, Bali, Shenkeng |
| Total | 29 | |

Figure S1. 17 diseases crude and age standardized PR

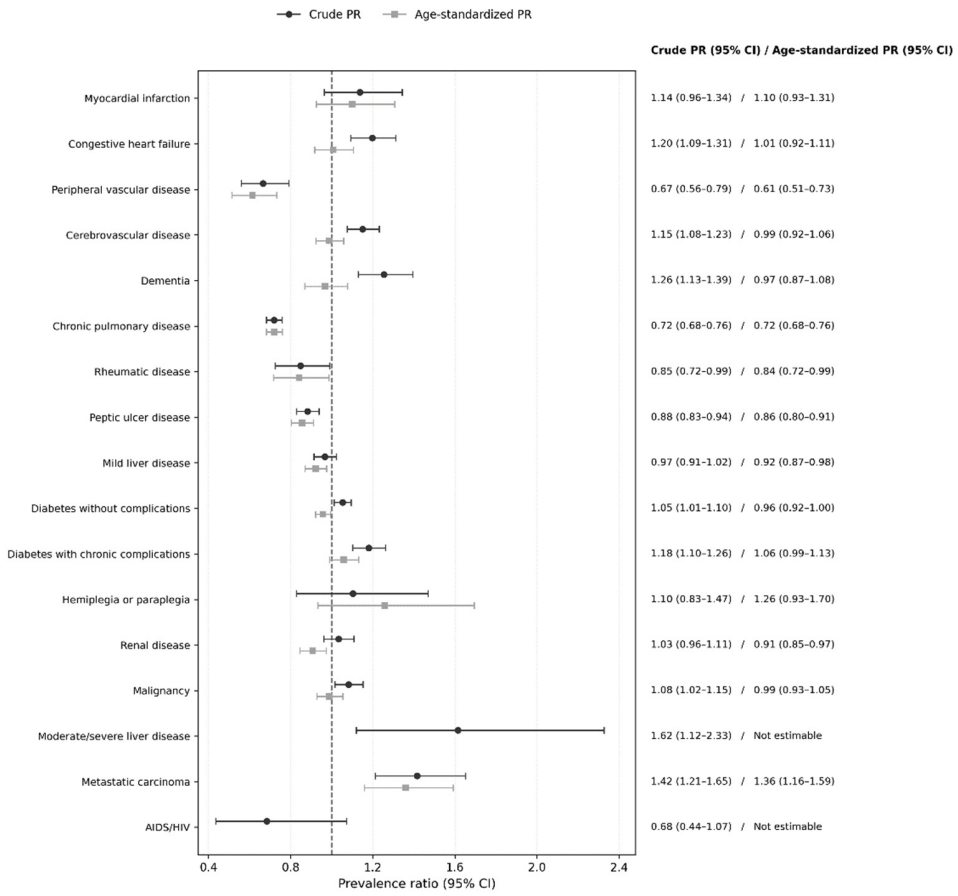


**Table S3** Relative outpatient visits and inpatient admissions per patient in Sanzhi compared with other nonremote areas of New Taipei City in 2024.

| Disease category | Relative OPD visits per patient | Relative IPD admissions per patient |
|---|---|---|
| Myocardial Infarction | 0.99 | 1.01 |
| Congestive Heart Failure | 1.00 | 1.03 |
| Peripheral Vascular Disease | 1.06 | 2.01 |
| Cerebrovascular Disease | 0.95 | 0.93 |
| Dementia | 1.00 | 1.12 |
| Chronic Pulmonary Disease | 1.09 | 1.81 |
| Rheumatic Disease | 1.20 | 0.97 |
| Peptic Ulcer Disease | 1.16 | 1.47 |
| Mild Liver Disease | 1.24 | 1.69 |
| Diabetes without complications | 0.98 | 1.09 |
| Diabetes with chronic complications | 0.87 | 1.07 |
| Paraplegia or hemiplegia | 0.54 | 1.13 |
| Renal Disease | 1.01 | 1.40 |
| Cancer | 1.00 | 1.29 |
| Moderate or severe liver disease | 1.39 | 1.50 |
| Metastatic carcinoma | 0.68 | 1.18 |
| AIDS/HIV | 1.13 | NA |

*All 17 Charlson Comorbidity Index disease categories are presented. Relative outpatient utilization ratios were available for all 17 categories, whereas relative inpatient utilization ratios were evaluable for 16 categories. The inpatient utilization ratio for AIDS/HIV could not be estimated because the inpatient count in Sanzhi was subject to small-cell suppression. NE indicates not estimable.

Figure S2. Sensitivity analysis of annual mean claims-derived Charlson Comorbidity Index among all beneficiaries and healthcare users, 2018–2024.

