



Supplementary Figure 2 Three geographical divisions of China.

Supplementary Table 1 Characteristics of the included studies

| ID | Study | Investigation time | Province | Questionnaire | Random sample | Quality score | Sample size | Number of cases | Subgroup |
|----|---|--------------------|-------------------|---------------|---------------|---------------|-------------|-----------------|--------------------------|
| 1 | Zhang <i>et al</i> , 2020 ^[1] | 2014~2019 | Jiangsu | GerdQ | No | 6 | 4785 | 858 | ① ② ③ ④ ⑥ ⑦ ⑩ ⑪ ⑫ ⑮ |
| 2 | Guo <i>et al</i> , 1997 ^[2] | 1996 | Beijing | Others | Yes | 6 | 2500 | 176 | — |
| 3 | Wu <i>et al</i> , 2004 ^[3] | 2000~2003 | Beijing | Others | Yes | 6 | 1936 | 167 | ③ |
| 4 | Pan <i>et al</i> , 1999 ^[4] | 1999 | Beijing, Shanghai | Others | Yes | 7 | 4992 | 448 | ② ③ ⑤ ⑨ |
| 5 | Jiang <i>et al</i> , 2010 ^[5] | 2008 | Beijing | RDQ | Yes | 7 | 2615 | 220 | ② ③ ④ ⑤ ⑦ ⑩ ⑪ ⑬ ⑮ |
| 6 | Ming <i>et al</i> , 2017 ^[6] | 2015 | Sichuan | GerdQ | Yes | 7 | 787 | 116 | ① ③ ④ |
| 7 | Xiong <i>et al</i> , 2006 ^[7] | 2003 | Guangdong | RDQ | Yes | 7 | 3338 | 83 | ② ③ ⑤ |
| 8 | Rong <i>et al</i> , 2013 ^[8] | 2013 | Xinjiang | GerdQ | Yes | 7 | 2980 | 468 | ① |
| 9 | Li <i>et al</i> , 2015 ^[9] | 2013 | Shanghai | RDQ | Yes | 6 | 3126 | 266 | ② ③ ⑩ ⑪ |
| 10 | Jiang <i>et al</i> , 2016 ^[10] | 2014 | Fujian | GerdQ | Yes | 7 | 936 | 89 | ① ② ③ ④ ⑩ ⑪ ⑫ |
| 11 | Peng, 2008 ^[11] | 2007 | Guangdong | RDQ | Yes | 6 | 3210 | 53 | ① ② ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑬ ⑮ |

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|----|--|-----------|-----------|--------|-----|---|------|-----|--------|
| 12 | Yao <i>et al</i> , 2018 ^[12] | 2014~2015 | Qinghai | RDQ | Yes | 8 | 3015 | 284 | ①②③④ |
| 13 | Cai <i>et al</i> , 2012 ^[13] | 2010 | Guangdong | RDQ | Yes | 5 | 1834 | 43 | — |
| 14 | Shen <i>et al</i> , 2010 ^[14] | 2009 | Fujian | RDQ | Yes | 7 | 1347 | 118 | ②③⑨ |
| 15 | Zhang <i>et al</i> , 2013 ^[15] | 2009~2011 | Shaanxi | RDQ | Yes | 7 | 2879 | 259 | ② |
| 16 | Xiang <i>et al</i> , 2012 ^[16] | 2011 | Jilin | RDQ | No | 4 | 2069 | 96 | ②③ |
| 17 | Wei <i>et al</i> , 2013 ^[17] | 2010 | Fujian | GerdQ | Yes | 7 | 203 | 10 | ②③ |
| 18 | Zhan <i>et al</i> , 2013 ^[18] | 2009 | Fujian | RDQ | Yes | 6 | 1982 | 134 | ② |
| 19 | Zhu <i>et al</i> , 2009 ^[19] | 2006 | Guizhou | RDQ | Yes | 6 | 1692 | 116 | ②③ |
| 20 | Li <i>et al</i> , 2014 ^[20] | 2012 | Henan | RDQ | Yes | 7 | 508 | 28 | ② |
| 21 | Hu <i>et al</i> , 2018 ^[21] | 2016 | Shanghai | RDQ | Yes | 7 | 2007 | 99 | ②③ |
| 22 | Zhang <i>et al</i> , 2005 ^[22] | 2004 | Xinjiang | Others | Yes | 8 | 4980 | 528 | ①②③⑨ |
| 23 | Shen <i>et al</i> , 2010 ^[23] | 2008 | Beijing | Others | Yes | 6 | 2502 | 207 | ②③④⑤⑪⑮ |
| 24 | Zhang <i>et al</i> , 2013 ^[24] | 2012 | Shanxi | GerdQ | No | 5 | 1210 | 116 | ② |
| 25 | Cai, 2008 ^[25] | 2005 | Hubei | RDQ | Yes | 7 | 3563 | 77 | ②③⑤ |

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|----|--|------------|--|--------|-----|---|-------|------|------------------|
| 26 | Lin <i>et al</i> , 2019 ^[26] | 2017 | Hubei | GerdQ | Yes | 7 | 3352 | 137 | ②③④⑦⑩⑪⑫⑭ |
| 27 | Li <i>et al</i> , 2019 ^[27] | 2017 | Xinjiang | GerdQ | No | 6 | 4987 | 887 | ①②③④⑩⑪⑫ |
| 28 | Li <i>et al</i> , 1997 ^[28] | 1997 | Shanghai | Others | Yes | 8 | 2500 | 192 | ②③⑨⑩⑪⑫ |
| 29 | He <i>et al</i> , 2010 ^[29] | 2007~2008 | Hubei, Shaanxi, RDQ Shanghai | | Yes | 8 | 16078 | 933 | ②③④⑤⑥⑦⑧⑨ ⑩⑪⑬⑮ |
| 30 | Chen, 2016 ^[30] | 2013~2014 | Henan | RDQ | Yes | 5 | 4856 | 345 | ②③⑤ |
| 31 | Ji, 2018 ^[31] | 2013 | Gansu | Others | Yes | 6 | 23297 | 1786 | ② |
| 32 | Wang, 2019 ^[32] | 2017~2018 | Shandong | GerdQ | Yes | 8 | 5149 | 570 | ②③⑥⑦⑩⑪⑫ |
| 33 | Lin <i>et al</i> , 2018 ^[33] | 2010~2012 | Eight provinces(not grouped byOthers province) | | Yes | 5 | 24208 | 1074 | — |
| 34 | Yin <i>et al</i> , 2013 ^[34] | 2008~2009 | Gansu, Shaanxi, Qinghai, Ningxia | RDQ | No | 6 | 12265 | 1246 | — |
| 35 | Wang <i>et al</i> , 2004 ^[35] | 2004 | Shaanxi | Others | Yes | 6 | 2532 | 98 | — |
| 36 | Wang <i>et al</i> , 2019 ^[36] | 2012 | Henan | GerdQ | Yes | 8 | 2844 | 492 | ②③⑥⑩⑪⑭ |
| 37 | Fang <i>et al</i> , 2019 ^[37] | 1996, 2008 | Beijing | Others | Yes | 7 | 2378 | 211 | — |

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|----|--|-----------|-----------|--------|-----|---|-------|------|-----------------|
| 38 | Gong <i>et al</i> , 2019 ^[38] | 2009~2016 | Beijing | GerdQ | No | 8 | 37442 | 7449 | ②③④⑩⑪⑬ |
| 39 | Cai <i>et al</i> , 2015 ^[39] | 2010~2011 | Henan | GerdQ | Yes | 6 | 2950 | 141 | — |
| 40 | Zhang <i>et al</i> , 2019 ^[40] | 2016~2017 | Tibet | GerdQ | Yes | 6 | 5680 | 614 | ①②③⑦⑩⑪ |
| 41 | Zou <i>et al</i> , 2009 ^[41] | 2009 | Shanghai | Others | Yes | 6 | 3135 | 84 | — |
| 42 | Yan <i>et al</i> , 2009 ^[42] | 2005~2006 | Shanghai | RDQ | Yes | 5 | 919 | 57 | — |
| 43 | Li <i>et al</i> , 2019 ^[43] | 2017~2018 | Guangdong | GerdQ | No | 5 | 1522 | 61 | — |
| 44 | Chen <i>et al</i> , 2012 ^[44] | 2007 | Zhejiang | Others | No | 6 | 8831 | 150 | ④ |
| 45 | Peng <i>et al</i> , 2009 ^[45] | 2006~2007 | Guangdong | Others | No | 5 | 2580 | 150 | — |
| 46 | Li <i>et al</i> , 2018 ^[46] | 2017~2018 | Shaanxi | Others | No | 5 | 887 | 23 | — |
| 47 | Liu <i>et al</i> , 2019 ^[47] | 2018 | Liaoning | RDQ | Yes | 7 | 986 | 82 | — |
| 48 | Ma <i>et al</i> , 2009 ^[48] | 2005~2006 | Shanghai | RDQ | Yes | 7 | 919 | 57 | ②③④⑤⑥⑦⑧⑨ ⑩⑪⑬ |
| 49 | Niu <i>et al</i> , 2012 ^[49] | 2011~2012 | Xinjiang | GerdQ | No | 6 | 1995 | 560 | ① |
| 50 | Ma <i>et al</i> , 2014 ^[50] | 2014 | Shanghai | RDQ | Yes | 6 | 1021 | 48 | — |
| 51 | Gao and Shi, 2017 ^[51] | 2013 | Beijing | Others | Yes | 5 | 3410 | 751 | ②③⑦⑩⑪⑫ |

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|----|---|-----------|--------------------|--------|-----|---|------|-----|---------|
| 52 | Qiao <i>et al</i> , 2014 ^[52] | 2013 | Jiangsu | RDQ | No | 4 | 249 | 17 | — |
| 53 | Zhong <i>et al</i> , 2012 ^[53] | 2012 | Sichuan | Others | No | 4 | 360 | 20 | — |
| 54 | Li <i>et al</i> , 2007 ^[54] | 2007 | Henan | RDQ | Yes | 5 | 508 | 28 | ② |
| 55 | Mei <i>et al</i> , 2008 ^[55] | 2008 | Zhejiang | RDQ | Yes | 5 | 3347 | 105 | ②③⑥ |
| 56 | Jia, 2017 ^[56] | 2015 | Jiangsu | RDQ | No | 4 | 221 | 20 | — |
| 57 | Gansu Cancer | 2013~2013 | Gansu | Others | Yes | 4 | 4000 | 345 | — |
| 58 | Chen <i>et al</i> , 2011 ^[58] | 2009~2011 | Four provinces(not | Others | No | 4 | 2253 | 432 | — |
| 59 | Liu <i>et al</i> , 2017 ^[59] | 2015~2016 | Shaanxi | Others | No | 4 | 2483 | 205 | — |
| 60 | Tang, 2011 ^[60] | 2009~2010 | Anhui | GerdQ | No | 5 | 347 | 43 | — |
| 61 | Lu <i>et al</i> , 2020 ^[61] | 2016 | Shandong | Others | No | 4 | 2925 | 452 | — |
| 62 | Ying <i>et al</i> , 2006 ^[62] | 2006 | Henan | RDQ | Yes | 6 | 327 | 21 | — |
| 63 | Chen <i>et al</i> , 2004 ^[63] | 2002~2003 | Tianjin | Others | Yes | 5 | 7220 | 406 | — |
| 64 | Yu, 2009 ^[64] | 2008 | Zhejiang | RDQ | No | 7 | 1369 | 109 | ②④⑥ |
| 65 | Guo, 2002 ^[65] | 1996 | Beijing | Others | Yes | 5 | 2486 | 254 | — |
| 66 | Xiang, 2014 ^[66] | 2012 | Hunan | RDQ | No | 5 | 200 | 14 | — |
| 67 | Yang, 2021 ^[67] | 2019 | Shaanxi | Others | Yes | 7 | 2423 | 302 | — |
| 68 | Chen, <i>et al</i> , 2021 ^[68] | 2018 | Inner Mongolia | GerdQ | Yes | 6 | 1069 | 84 | ②③④⑩⑪⑫⑭ |
| 69 | He, <i>et al</i> , 2013 ^[69] | 2011 | Shanghai | GerdQ | Yes | 5 | 1428 | 85 | — |

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|----|------------------------------|------|----------|-------|-----|---|------|------|---------|
| 70 | Kahaer, 2021 ^[70] | 2020 | Xinjiang | GerdQ | Yes | 7 | 5080 | 1187 | ①②③④⑨⑩⑪ |
|----|------------------------------|------|----------|-------|-----|---|------|------|---------|

①Nation ②Sex ③Gender ④Body mass index (BMI) ⑤Residence ⑥Marital status ⑦Education ⑧Income ⑨Occupation ⑩Smoking
⑪Alcohol consumption ⑫Teadrinking ⑬Physical exercise ⑭Helicobacter pylori(HP) ⑮Life stress.

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