

**Appendix table 1. The location and distribution range of high rate clusters**

| Case definition                               | Cluster Type | Latitude | Longitude | Radius (km) |
|---|--------------|----------|-----------|-------------|
| <b>Socio-demographic characteristics</b>      |              |          |           |             |
| Marital: Married/cohabitated                  | Primary      | 23.1255  | 113.2593  | 4.38        |
| Duration of living in GZ: ≤1 year             | Primary      | 23.1651  | 113.4273  | 2.54        |
| Migrants: Yes                                 | Primary      | 23.1895  | 113.4207  | 6.62        |
| College students: Yes                         | Primary      | 23.1785  | 113.3881  | 6.95        |
| <b>Sexual risk behaviors</b>                  |              |          |           |             |
| Ever used alcohol/other drugs before sex: Yes | Primary      | 23.1842  | 113.4178  | 0.97        |
| Anal intercourse: Yes                         | Primary      | 23.1876  | 113.4044  | 1.56        |
| Unprotected sex: Yes                          | Primary      | 23.1706  | 113.3273  | 3.65        |
| <b>STDs/HIV</b>                               |              |          |           |             |
| STDs test: Yes                                | Primary      | 23.2191  | 113.3723  | 6.05        |
| HIV test: Yes                                 | Primary      | 23.1162  | 113.2613  | 2.87        |

**Appendix table 2. The location and distribution range of low rate clusters**

| Case definition                                    | Cluster Type | Latitude | Longitude | Radius (km) |
|--|--------------|----------|-----------|-------------|
| <b>Socio-demographic characteristics</b>           |              |          |           |             |
| Marital: Married/cohabitated                       | Primary      | 23.2284  | 113.3920  | 12.35       |
| Migrants: Yes                                      | Primary      | 23.1145  | 113.2822  | 4.29        |
| College students: Yes                              | Primary      | 23.1094  | 113.2969  | 5.28        |
| <b>Sexual risk behaviors</b>                       |              |          |           |             |
| Consumption of alcohol/other drugs before sex: Yes | Primary      | 23.1580  | 113.3595  | 5.39        |
| Multiple sexual partnerships: Yes                  | Primary      | 23.1155  | 113.3093  | 3.03        |
| Casual sex partners: Yes                           | Primary      | 23.1155  | 113.3093  | 3.08        |
| <b>STDs/HIV</b>                                    |              |          |           |             |
| STDs test: Yes                                     | Primary      | 23.1223  | 113.4022  | 2.32        |
| HIV test: Yes                                      | Primary      | 23.1539  | 113.3398  | 1.94        |