Supplementary Table 1: Crude incidence rates of patients in the original cohort

| Cancer sites | Insulin exposure | No. cases | No. patients | Person-years | CIR    |
|--------------|------------------|-----------|--------------|--------------|--------|
| BTC          | never            | 143       | 202,557      | 1,078,146.10 | 13.26  |
|              | ever             | 103       | 164,997      | 882,371.60   | 11.67  |
|              | ever             | 40        | 37,560       | 195,774.50   | 20.43  |
| ICC          | never            | 22        | 202,557      | 1,078,146.10 | 2.04   |
|              | ever             | 18        | 164,997      | 882,371.60   | 2.04   |
|              | ever             | 4         | 37,560       | 195,774.50   | 2.04   |
| GBC          | never            | 69        | 202,557      | 1,078,146.10 | 6.40   |
|              | ever             | 53        | 164,997      | 882,371.60   | 6.01   |
|              | ever             | 16        | 37,560       | 195,774.50   | 8.17   |
| ECC          | never            | 52        | 202,557      | 1,078,146.10 | 4.82   |
|              | ever             | 32        | 164,997      | 882,371.60   | 3.63   |
|              | ever             | 20        | 37,560       | 195,774.50   | 10.22  |
| Male         | never            | 65        | 104,810      | 553,840.60   | 11.74  |
|              | ever             | 39        | 85,332       | 453,535.30   | 8.60   |
|              | ever             | 26        | 19,478       | 100,308.30   | 25.92  |
| Female       | never            | 78        | 97,747       | 524,111.01   | 14.88  |
|              | ever             | 64        | 79,665       | 428,693.37   | 14.93  |
|              | ever             | 14        | 18,082       | 95,417.64    | 14.67  |
| < 60*        | never            | 10        | 85,439       | 451,900.80   | 2.21   |
|              | ever             | 8         | 71,613       | 379,914.78   | 2.11   |
| ≥60*         | never            | 133       | 117,118      | 626,053.80   | 21.24  |
|              | ever             | 95        | 93,384       | 502,313.90   | 18.91  |
|              | ever             | 38        | 23,734       | 123,739.90   | 30.71  |

BTC: biliary tract cancer; ICC: intrahepatic cholangiocarcinoma; GBC: gallbladder cancer; ECC: extrahepatic cholangiocarcinoma; CIR: crude incidence rates, per 100,000 person-years; *years old.