Supplemental Table 1. Participation rate

|  |  |  |  |
| --- | --- | --- | --- |
| Participation | Lower | Actual | Higher |
| **Colonoscopy-based screening** |  |  |  |
| Colonoscopy adherence | 0.2 | 0.4 | 1 |
| **FIT-based screening** |  |  |  |
| Participation rate of FIT | 0.5 | 0.7 | 1 |
| Colonoscopy adherence (with positive FIT results) | 0.6 | 0.8 | 1 |
| **Risk-adapted screening** |  |  |  |
| Participation rate of FIT | 0.5 | 0.7 | 1 |
| Colonoscopy adherence (high risk assessed as by APCS) | 0.4 | 0.6 | 1 |
| Colonoscopy adherence (with positive FIT results) | 0.6 | 0.8 | 1 |

Abbreviation: FIT, fecal immunochemical test; APCS, the Asia-Pacific Colorectal Screening.

Supplemental Table 2. Diagnostic performance

|  |  |
| --- | --- |
| **Diagnostic performance** | **Value** |
| **Colonoscopy** |  |
| Sensitivity | 1.000 |
| Specificity | 1.000 |
| **FIT-based screening** |  |
| Sensitivity |  |
| CRC | 0.571 |
| AA | 0.129 |
| Specificity |  |
| No AN | 0.974 |
| **Risk-adapted screening** |  |
| Sensitivity of APCS-based assessment |  |
| CRC | 0.143 |
| AA | 0.153 |
| Specificity of APCS-based assessment |  |
| No AN | 0.919 |
| Sensitivity of FIT |  |
| CRC | 0.583 |
| AA | 0.139 |
| Specificity of FIT |  |
| No AN | 0.974 |

Abbreviation: FIT, fecal immunochemical test; APCS, the Asia-Pacific Colorectal Screening; CRC, colorectal cancer; AA, advanced adenoma; AN, advanced neoplasm.

Supplemental Table 3. Unit costs

|  |  |
| --- | --- |
| Variables | Costs (2018 RMB) |
| FIT kit | 30 |
| Questionnaire (APCS-based assessment) | 5 |
| Biochemical examination | 70 |
| Cathartic | 55 |
| Colonoscopy | 230 |
| Biopsy | 160 |

Abbreviation: FIT, fecal immunochemical test; APCS, the Asia-Pacific Colorectal Screening.

Supplemental Table 4. Diagnostic yield, and cost per advanced neoplasm for screening strategies with single round of screening in a hypothetical cohort of 100,000 participants with low adherence

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Positive threshold | Number of lesions Detected | Missed cases (%) | Total colonoscopy | Averted colonoscopy (%) | Total cost needed | Saved cost (%) | Cost per lesion detected | Reduced cost per lesion (%) |
| (APCS; FIT, μg Hb/g) |
| **Colonoscopy** | 1,660 | Reference | 20,000 | Reference | 8,911,200 | Reference | 5,368 | Reference |
| **FIT** |  |  |  |  |  |  |  |  |
| None; 10 | 427 | 74.3 | 1,142 | 94.3 | 2,095,073 | 76.5 | 4,906 | 8.6 |
| None; 20 | 385 | 76.8 | 852 | 95.7 | 1,958,683 | 78.0 | 5,087 | 5.2 |
| None; 30 | 340 | 79.5 | 670 | 96.7 | 1,863,381 | 79.1 | 5,481 | -2.1 |
| **Risk-adapted screening method** |  |  |  |  |  |  |  |  |
| 3; 10 | 1,899 | -14.4 | 16,588 | 17.1 | 9,005,733 | -1.1 | 4,742 | 11.7 |
| 3; 20 | 1,881 | -13.3 | 16,438 | 17.8 | 8,939,746 | -0.3 | 4,753 | 11.5 |
| 3; 30 | 1,872 | -12.8 | 16,363 | 18.2 | 8,902,295 | 0.1 | 4,755 | 11.4 |
| 4; 10 | 1,468 | 11.6 | 10,303 | 48.5 | 6,504,134 | 27.0 | 4,431 | 17.5 |
| 4; 20 | 1,442 | 13.1 | 10,123 | 49.4 | 6,418,353 | 28.0 | 4,451 | 17.1 |
| 4; 30 | 1,424 | 14.2 | 10,009 | 50.0 | 6,361,074 | 28.6 | 4,467 | 16.8 |
| 5; 10 | 763 | 54.0 | 3,649 | 81.8 | 3,686,674 | 58.6 | 4,832 | 10.0 |
| 5; 20 | 719 | 56.7 | 3,377 | 83.1 | 3,557,798 | 60.1 | 4,948 | 7.8 |
| 5; 30 | 683 | 58.9 | 3,240 | 83.8 | 3,488,837 | 60.8 | 5,108 | 4.8 |

Abbreviation: FIT, fecal immunochemical test; APCS, the Asia-Pacific Colorectal Screening; CRC, colorectal cancer; AA, advanced adenoma; AN, advanced neoplasm.

a Risk-adapted screening method was conducted based on APCS score. Subjects with scores at or greater than positive thresholds were defined as high-risk and were referred for a colonoscopy; those with scores less than positivity threshold were defined as low-risk and were referred for FIT screening.

Supplemental Table 5. Diagnostic yield, and cost per advanced neoplasm for screening strategies with single round of screening in a hypothetical cohort of 100,000 participants with high participation

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Positive threshold | Number of lesions Detected | Missed cases (%) | Total colonoscopy | Averted colonoscopy (%) | Total cost needed | Saved cost (%) | Cost per lesion detected | Reduced cost per lesion (%) |
| (APCS; FIT, μg Hb/g) |
| **Colonoscopy** | 8,300 | Reference | 100,000 | Reference | 44,556,000 | Reference | 5,368 | Reference |
| **FIT** |  |  |  |  |  |  |  |  |
| None; 10 | 1,425 | 82.8 | 3,809 | 96.2 | 4,984,794 | 88.8 | 3,498 | 34.8 |
| None; 20 | 1,282 | 84.6 | 2,841 | 97.2 | 4,529,481 | 89.8 | 3,533 | 34.2 |
| None; 30 | 1,132 | 86.4 | 2,232 | 97.8 | 4,210,548 | 90.5 | 3,720 | 30.7 |
| **Risk-adapted screening method** |  |  |  |  |  |  |  |  |
| 3; 10 | 6,331 | 23.7 | 55,293 | 44.7 | 27,929,185 | 37.3 | 4,411 | 17.8 |
| 3; 20 | 6,272 | 24.4 | 54,795 | 45.2 | 27,710,145 | 37.8 | 4,418 | 17.7 |
| 3; 30 | 6,241 | 24.8 | 54,544 | 45.5 | 27,584,845 | 38.1 | 4,420 | 17.7 |
| 4; 10 | 4,893 | 41.0 | 34,340 | 65.7 | 19,149,822 | 57.0 | 3,914 | 27.1 |
| 4; 20 | 4,807 | 42.1 | 33,742 | 66.3 | 18,864,898 | 57.7 | 3,924 | 26.9 |
| 4; 30 | 4,747 | 42.8 | 33,363 | 66.6 | 18,674,480 | 58.1 | 3,934 | 26.7 |
| 5; 10 | 2,545 | 69.3 | 12,164 | 87.8 | 9,296,315 | 79.1 | 3,653 | 31.9 |
| 5; 20 | 2,399 | 71.1 | 11,260 | 88.7 | 8,868,098 | 80.1 | 3,697 | 31.1 |
| 5; 30 | 2,278 | 72.6 | 10,802 | 89.2 | 8,637,517 | 80.6 | 3,792 | 29.4 |

Abbreviation: FIT, fecal immunochemical test; APCS, the Asia-Pacific Colorectal Screening; CRC, colorectal cancer; AA, advanced adenoma; AN, advanced neoplasm.

a Risk-adapted screening method was conducted based on APCS score. Subjects with scores at or greater than positive thresholds were defined as high-risk and were referred for a colonoscopy; those with scores less than positivity threshold were defined as low-risk and were referred for FIT screening.