Status and associated factors of cross-regional healthcare-seeking among patients with advanced colorectal cancer in China: a multicenter cross-sectional study

Jian-Gong Zhang, Hong Wang, Xiao-Fen Gu, Xiao-Yang Wang, Wen-Jun Wang, Ling-Bin Du, He-Lu Cao, Xi Zhang, Ji-Hai Shi, Yu-Qian Zhao, Li Ma, Yun-Yong Liu, Juan-Xiu Huang, Ji Cao, Yan-Ping Fan, Li Li, Chang-Yan Feng, Qian Zhu, Jing-Chang Du, Xiao-Hui Wang, Bin-Bin Han, You-Lin Qiao; China Working Group on Colorectal Cancer Survey

Background: The imbalanced allocation of medical resources leads to the occurrence of cross-regional healthcare-seeking in China. Due to the low cure rate, advanced colorectal cancer (CRC) patients may seek cross-regional healthcare for high-level medical facilities. Investigating status of cross-regional healthcare-seeking and its associated factors among advanced CRC patients is important for policymakers to understand access to health services and improve the quality of oncology services.

Methods: From March 2020 to March 2021, a cross-sectional, nation-wide, hospital-based, multi-center survey was conducted. Nineteen hospitals in seven regions were selected by multi-stage stratified sampling.

© Annals of Translational Medicine. All rights reserved.
Introduction

The basic medical insurance system of China mainly includes basic medical insurance for urban and rural residents and basic medical insurance for employees (1), forming an almost “medical insurance for all” system. The principle of the system is local administration. That is, individuals need to participate in the basic medical insurance of the local region, with insurance funds being under the unified collection, utilization, and management within the region (2). However, with rapid economic development and accelerated urbanization, cross-regional population movement occurs frequently, resulting in a phenomenon known as cross-regional healthcare-seeking, in which individuals seek health facilities outside the local administration policy of medical insurance (3). The behavior of seeking cross-regional health care encompasses three aspects: across counties, across cities, and across provinces (2). Due to the imbalanced allocation of medical resources between regions in China and individuals’ pursuit of quality health services, cross-regional healthcare-seeking is further aggravated (4).

Owing to discrepancies in medical insurance strategies across regions (5), individuals may encounter some difficulties when they seek cross-regional health care, such as complicated administrative approval procedures as well as unfamiliar cross-regional healthcare-seeking processes and reimbursement policies (2,6). To address these problems, the government has adopted measures since 1998, including the disbursement and reimbursement policy released in 2008, the policy of direct settlement of cross-regional healthcare-seeking within the province released in 2015, and the policy of direct settlement of cross-provincial health care in designated medical institutions released in 2020. However, after these reforms, whether the status of cross-regional healthcare-seeking and procedural problems are ameliorated have not been fully studied.

Colorectal cancer (CRC) is one of the common malignant tumors and a serious threat to the health of humans. According to Global Cancer Observatory (GLOBOCAN) 2020 data, it was estimated that about 555,477 new cases of CRC occurred in China in 2020, ranking second among all malignant tumors (7). Although the screening coverage...
of CRC has been expanded (8-13), most CRC patients are diagnosed at an advanced stage in China. Compared with patients in the early stage, the 5-year survival rate of patients in the advanced stage decreases significantly (14), with increased difficulties in treatment. The allocation of medical resources in China is imbalanced. High-quality medical resources distributed mainly in eastern provinces, followed by central provinces, with western provinces least (15). In particular, high-quality medical resources in remote areas and rural areas are still in short supply, all of which can lead to cross-regional healthcare sought by CRC patients to pursue a better remedy. Noticeably, patients often face a series of difficulties in the process, such as high self-payment ratio, reimbursement delay, and indirect cost (16). Despite the benefit of the instant reimbursement system of cross-regional medical services, there is a lack of the general implementation of this policy. However, there are limited studies on status of cross-regional healthcare-seeking among cancer patients. In order to understand the current status and associated factors of cross-regional healthcare-seeking among patients with advanced CRC in China, this study was conducted based on a nation-wide multi-center survey. The results are expected to provide evidence for the formulation of CRC prevention and control measures as well as the optimization of cross-regional healthcare-seeking policy in the future. We present the following article in accordance with the SURGE reporting checklist (available at https://atm.amegroups.com/article/view/10.21037/atm-22-1003/rc).

Methods

Study design and sites

From March 2020 to March 2021, a cross-sectional, nation-wide, hospital-based, multi-center survey was conducted in mainland China. Multi-stage stratified sampling was adopted to select the participant hospitals across seven geographic regions (northeastern, northern, northwestern, eastern, central, southern, and southwestern) to ensure a balanced distribution. In stage one, two cities from each region were selected by convenient sampling. In stage two, one tertiary cancer hospital and/or one general hospital were selected from each city. Finally, a total of 19 hospitals (10 tertiary cancer hospitals and nine general hospitals) were selected.

Study population

All eligible CRC patients in the selected hospitals were invited verbally by the interviewer to participate current study. Patients will receive a CRC health knowledge booklet as payment after being surveyed. The inclusion criteria of the study were as follows: (I) CRC patients with stage III or IV disease; (II) patients aged ≥18 years old; and (III) patients who provided informed consent. Patients were excluded if they had severe physical, cognitive, and/or verbal impairments that would interfere with their ability to complete the questionnaire. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This research was approved by the independent review board of Henan Cancer Hospital (No. 2019273), and the other 18 hospitals were informed and agreed with the study. Informed consent was taken from all the patients. Staging of CRC was performed according to the 8th edition of the American Joint Committee on Cancer (AJCC) tumor-node-metastasis (TNM) staging system.

It has been estimated that there are about 400,000 advanced CRC patients in China (17,18). To ensure the representativeness of the sample, this study was expected to recruit about 1% of the patients. Considering the non-response rate of 10%, more than 4,445 patients would be enrolled into this survey. The sample size of each region was allocated proportionally according to the population density.

Data collection

All of the eligible respondents were interviewed face-to-face using a semi-structured questionnaire by interviewers who were systematically trained before the study was launched. The detailed information included was as follows: (I) basic demographic information including birthdate, gender, occupational situation, marital status, education, and annual household income of patients; (II) clinical information including type of cancer (colon cancer, rectal cancer, and both) and metastasis status at diagnosis; and (III) medical treatment history including information on cross-regional healthcare-seeking (cross-regional healthcare-seeking refers to the health-seeking behavior occurring outside the local administration policy of medical insurance, that is, the medical insured place and the place where the medical expenses occurred are not in the same area), and difficulties
encountered during cross-regional healthcare-seeking.

Statistical analysis

In the current analysis, the questionnaire was regarded as complete and was included in the analysis if more than 95% items were filled. Unfilled items were included in the analysis as missing values. Continuous variables conforming to a normal distribution were presented as the mean ± standard deviation (SD). Categorical variables were presented as frequency and percentage. The variable “Has the patients ever sought cross-regional healthcare-seeking” was taken as the dependent variable, and factors including age, gender, marital status, occupations of patients and/or their families, education, annual household income of patients, metastasis status at diagnosis, and type of cancer were taken as the potential independent variables. Univariate logistic regression model was used to explore factors related to cross-regional healthcare-seeking, and then the variables with statistical significance in univariate regression analysis were included in the multivariate logistic regression model to determine the independent risk factors related to cross-regional healthcare-seeking. All statistical analyses were performed using SAS 9.4 (SAS Institute, Cary, NC, USA), and the significance level was set to two-sided α=0.05.

Results

Patient characteristics

A total of 4,589 CRC patients in stage III or IV were included in the current analysis. The mean age was 60.1±11.6 years, with 45.9% of the patients in the 50–64 years age group, 59.5% of the patients were males, and 55.0% completed junior or senior high school. Most of the patients and their families (87.6%) were not engaged in healthcare-related industries. Over 95% of patients had medical insurance, and most of the patients (57.5%) had an annual household income of less than 50,000 Chinese Yuan (CNY). A total of 37.5% of the patients had metastatic CRC at diagnosis, and 53.8% had rectal cancer (Table 1).

Current situation of cross-regional healthcare-seeking and barriers

More than one-third (36.5%) of the patients had sought cross-regional healthcare-seeking previously, among which

| Variables                                      | No. | %    |
|-----------------------------------------------|-----|------|
| Age (years), mean ± SD                        | 60.1±11.6 |     |
| <50                                           | 761 | 16.6 |
| 50–64                                         | 2,105 | 45.9 |
| ≥65                                           | 1,723 | 37.5 |
| Gender                                        |     |      |
| Male                                          | 2,730 | 59.5 |
| Female                                        | 1,859 | 40.5 |
| Marital status*                               |     |      |
| Married                                       | 4,318 | 94.1 |
| Other                                         | 270  | 5.9  |
| Occupations of patients and/or their families*|     |      |
| Non-healthcare-related                        | 4,017 | 87.6 |
| Healthcare-related                            | 569  | 12.4 |
| Education*                                    |     |      |
| Primary school or below                       | 1,330 | 29.0 |
| Junior or senior high school                  | 2,522 | 55.0 |
| Undergraduate or above                        | 734  | 16.0 |
| Health-care insurance type (multiple response)|     |      |
| Urban employees basic medical insurance       | 1,923 | 41.9 |
| Urban residents basic medical insurance        | 996  | 21.7 |
| New rural cooperative medical scheme          | 1,560 | 34.0 |
| Critical illness insurance program            | 249  | 5.4  |
| Commercial medical insurance                  | 220  | 4.8  |
| Uninsured                                     | 51   | 1.1  |
| Annual household income of patients (CNY)     |     |      |
| <50,000                                       | 2,640 | 57.5 |
| 50,000–99,999                                 | 1,293 | 28.2 |
| ≥100,000                                      | 656  | 14.3 |
| Metastasis at diagnosis*                      |     |      |
| Yes                                           | 1,709 | 37.5 |
| No                                            | 2,854 | 62.6 |
| Type of cancer*                               |     |      |
| Colon                                         | 2,063 | 45.0 |
| Rectum                                        | 2,470 | 53.8 |
| Other                                         | 55   | 1.2  |

*, some data are missing. SD, standard deviation; CNY, Chinese Yuan.
31.9% had encountered problems. Before seeking cross-regional health care, the most common barrier encountered by patients was the complicated procedures of reporting the cross-regional health-seeking behavior to the local administration system of medical insurance (95.3%). In the process of cross-regional healthcare-seeking, the most confusing problem for patients was that the pathological report in the local region was unacceptable and required re-examination (34.8%). After seeking cross-regional health care, patients also encountered barriers such as expenses for outpatient services, which cannot be reimbursed (71.0%), and reimbursement delays (59.4%). More details are shown in Figure 1.

**Univariate and multivariate analyses of cross-regional healthcare-seeking**

We performed univariate logistic regression analysis, and the results showed that the associated factors of seeking cross-regional health care included age, marital status, education, annual household income of patients, and metastasis status at diagnosis (Table 2).

A multivariate logistic regression was further performed to identify the factors associated with cross-regional health care. The results showed that the associated factors included age, education, annual household income of patients, and metastasis status at diagnosis.
### Table 2  Univariate analysis of seeking cross-regional health care in advanced colorectal cancer patients

| Variables                        | Seeking cross-regional health care* | OR (95% CI) | P       |
|----------------------------------|-------------------------------------|-------------|---------|
|                                  | Yes   | No   |          |         |
| Age (years)                      |       |      |          |         |
| <50                              | 358 (47.0) | 403 (53.0) | 1 | –       |
| 50–64                            | 835 (39.7) | 1,268 (60.3) | 0.74 (0.63, 0.88) | <0.001 |
| ≥65                              | 441 (27.8) | 1,181 (72.2) | 0.43 (0.36, 0.52) | <0.001 |
| Gender                           |       |      |          |         |
| Male                             | 1,025 (37.6) | 1,703 (62.4) | 1 | –       |
| Female                           | 647 (34.8) | 1,212 (65.2) | 0.89 (0.78, 1.00) | 0.056  |
| Marital status*                  |       |      |          |         |
| Married                          | 1,589 (36.8) | 2,727 (63.2) | 1 | –       |
| Other                            | 82 (30.4) | 188 (69.6) | 0.75 (0.57, 0.98) | 0.033  |
| Occupations of patients and/or their families* |       |      |          |         |
| Non-healthcare-related           | 1,444 (36.0) | 2,571 (64.0) | 1 | –       |
| Healthcare-related               | 228 (40.1) | 341 (59.9) | 1.19 (1.00, 1.43) | 0.057  |
| Education*                       |       |      |          |         |
| Primary school or below          | 406 (30.5) | 924 (69.5) | 1 | –       |
| Junior or senior high school     | 923 (36.6) | 1,597 (63.4) | 1.32 (1.14, 1.52) | <0.001 |
| Undergraduate or above           | 340 (46.3) | 394 (53.7) | 1.96 (1.63, 2.37) | <0.001 |
| Annual household income of patients (CNY) |       |      |          |         |
| <50,000                          | 882 (33.4) | 1,756 (66.6) | 1 | –       |
| 50,000–99,999                    | 471 (36.4) | 822 (63.6) | 1.14 (0.99, 1.31) | 0.064  |
| ≥100,000                         | 319 (48.6) | 337 (51.4) | 1.89 (1.59, 2.24) | <0.001 |
| Metastasis at diagnosis*         |       |      |          |         |
| No                               | 959 (33.6) | 1,893 (66.4) | 1 | –       |
| Yes                              | 701 (41.0) | 1,008 (59.0) | 1.37 (1.21, 1.55) | <0.001 |
| Type of cancer*                  |       |      |          |         |
| Colon                            | 760 (36.8) | 1,303 (63.2) | 1 | –       |
| Rectum                           | 887 (35.9) | 1,582 (64.1) | 0.96 (0.85, 1.09) | 0.524  |
| Other                            | 24 (44.4) | 30 (55.6) | 1.37 (0.80, 2.36) | 0.255  |

*, some data are missing. OR, odds ratio; CI, confidence interval; CNY, Chinese Yuan.

healthcare-seeking among advanced CRC patients, and the results are shown in Table 3. Patients who were above 50 years old [50–64 years old: odds ratio (OR) =0.80, 95% confidence interval (CI): 0.68–0.95; over 65 years old: OR =0.50, 95% CI: 0.41–0.60] were less likely to seek cross-regional health care. Patients who completed undergraduate education or above (OR =1.40, 95% CI: 1.13–1.73), had an annual household income of more than 100,000 CNY (OR =1.46, 95% CI: 1.21–1.78), and had metastasis at the time of diagnosis (OR =1.33, 95% CI: 1.18–1.51) were more likely...
to seek cross-regional health care.

**Discussion**

In this study, we found that 36.5% of advanced CRC patients had previously sought cross-regional health care, and its associated factors included age, education, annual household income of patients, and metastasis at diagnosis. This study deepened our understanding of cross-regional health care sought by CRC patients and may offer a wide range of possibilities for the improvement of health care policy.

The most obvious finding was that 36.5% of advanced CRC patients had sought cross-regional health care previously, and among these patients, 31.9% had encountered problems. In fact, the principle of the medical insurance system in China is localized management; that is, individuals need to participate in the basic medical insurance in the local region, and the insurance fund is also under unified collection, utilization, and management within the region (2). Based on this, patients will face complicated procedures when they seek cross-regional medical care (2). Consistent with this, our results showed that the most common barrier faced by CRC patients who encountered problems during their cross-regional care seeking was the complicated procedures (95.3%). Other prominent problems included expenses for outpatient services that could not be reimbursed (71.0%), reimbursement delays (59.4%), and pathological reports in the local region that was unacceptable and required re-examination (34.8%). The results described the patients' predicament during their cross-regional healthcare seeking and emphasized the urgent need to improve medical care policy.

The second major finding was that age, education, annual household income of patients, and metastasis at diagnosis were associated with seeking cross-regional health care. We found that elderly CRC patients were less likely to seek cross-regional health care, which is consistent with previous studies that have shown elderly patients are less prone to bypass local facilities (19-21). This may be attributed to the fact that elderly people have more difficulties traveling or have stronger relationships with their local professionals (19). Furthermore, the results showed that relatively higher-level education was associated with the preference for cross-regional healthcare-seeking, corroborating previous research into the association between education and cross-regional healthcare-seeking.

### Table 3 Multivariate analysis of seeking cross-regional health care in advanced colorectal cancer patients

| Variables                        | β-coefficient | OR (95% CI) | P     |
|----------------------------------|--------------|-------------|-------|
| **Age (years)**                  |              |             |       |
| <50                              | Reference    | 1           | –     |
| 50–64                            | −0.219       | 0.80 (0.68, 0.95) | 0.013 |
| ≥65                              | −0.701       | 0.50 (0.41, 0.60) | <0.001 |
| **Education**                    |              |             |       |
| Primary school or below          | Reference    | 1           | –     |
| Junior or senior high school     | 0.124        | 1.13 (0.97, 1.32) | 0.107 |
| Undergraduate or above           | 0.333        | 1.40 (1.13, 1.73) | 0.002 |
| **Annual household income of patient (CNY)** |              |             |       |
| <50,000                          | Reference    | 1           | –     |
| 50,000–99,999                    | 0.005        | 1.01 (0.87, 1.17) | 0.945 |
| ≥100,000                         | 0.381        | 1.46 (1.21, 1.78) | <0.001 |
| **Metastasis at diagnosis**      |              |             |       |
| No                               | Reference    | 1           | –     |
| Yes                              | 0.288        | 1.33 (1.18, 1.51) | <0.001 |

OR, odds ratio; CI, confidence interval; CNY, Chinese Yuan.
We also observed that the patients who had an annual household income of more than 100,000 CNY preferred to seek cross-regional health care, compared with lower income groups. This result was consistent with the findings of previous studies, which showed that there was a higher likelihood of bypassing relatively low-level facilities with increasing wealth or income (22-25).

Noticeably, our study showed that patients with metastasis at diagnosis had a higher tendency to seek cross-regional health care, which was consistent with previous reports (21,22). This may be due to the fact that metastasis status, regarded as the reflection of patients’ perceived demands for healthcare, can motivate them to seek medical care. For patients suffering from a more severe medical condition, the pursuit of more sophisticated hospitals to obtain high-quality care are especially important. Therefore, it is urgent to improve the service quality of primary medical facilities to meet the needs of CRC patients and strengthen their trust in basic facilities. Additionally, considering that most CRC patients in China are in an advanced stage at diagnosis, cancer screening and early diagnosis are critical measures to decrease the disease burden and relieve the pressure of upper-level medical facilities. Thus, it is necessary to strengthen the early screening, diagnosis, and treatment of CRC, and expand the screening coverage in an orderly manner, thereby improving the quality of life of people.

Despite the advantages of this study, including the large sample size and national multi-center design, it also has some limitations that should be noted. Firstly, self-reported data on cross-regional healthcare-seeking might have resulted in recall bias and affected the reliability or validity of the results. Secondly, respondents might have avoided some sensitive questions, such as economic status, or inaccurately reported answers, which could confound the results. Furthermore, there is a possibility that the difficulties of seeking cross-regional health care was exaggerated, owing to the patients’ negative emotion during medical care. Finally, generalization of the findings could be limited because only advanced CRC patients were enrolled in current study. We will conduct further studies to support the present findings.

In summary, this study assessed the status of cross-regional care seeking and its associated factors among advanced CRC patients. The results showed that about one-third of patients had sought cross-regional health care, highlighting the imbalanced allocation of medical resources. These findings demonstrate that there is still a need to improve the quality of primary care facilities and optimize the health care system.

**Acknowledgments**

*Funding:* This research was funded by Beijing Love Book Cancer Foundation and Merck Serono Co. Ltd.

**Footnote**

*Reporting Checklist:* The authors have completed the SURGE reporting checklist. Available at https://atm.americanstudies.com/article/view/10.21037/atm-22-1003/rc

*Data Sharing Statement:* Available at https://atm.americanstudies.com/article/view/10.21037/atm-22-1003/dss

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at https://atm.americanstudies.com/article/view/10.21037/atm-22-1003/coif). All authors report that the research was funded by Merck Serono Co. Ltd. The authors have no other conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This research was approved by the independent review board of Henan Cancer Hospital (No. 2019273), and the other 18 hospitals were informed and agreed with the study. Informed consent was taken from all the patients.

*Open Access Statement:* This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: https://creativecommons.org/licenses/by-nc-nd/4.0/.

**References**

1. Wei N, Huang W, Zhou LL. Impact of Catastrophic
Health Expenditures on Chinese Household Consumption. Front Public Health 2021;9:646494.

2. Shang Y. Evaluation of the “Instant Reimbursement of Cross-provincial Medical Services” Policy in China: Evidence from Survey on Four Provinces: University of Chinese Academy of Social Sciences; 2020.

3. Li Y, Zhao L, Zhang D, et al. Analysis on Remote Medical Settlement in China. Chinese Health Economics 2016;35:28-30.

4. Xie L, Chen Q, Hu H. Research Progress for Remote Medical Treatment of Basic Medical Insurance in China. Chinese Hospital Management 2018;38:25-7.

5. Gu X. Fragmentation of China’s Health Insurance System and the Way of Its Governance. Xue Hai 2017:126-33.

6. Wang Y, Xu W, Xu Z, et al. Study on the Medical Behaviors and Medical Expenses of Different Types of Cross-Province Healthcare in 3 Cities in Jiangsu. Chinese Health Economics 2021;40:23-7.

7. Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin 2021;71:209-49.

8. Cai SR, Huang YQ, Zhang SZ, et al. Effects of subitems in the colorectal cancer screening protocol on the Chinese colorectal cancer screening program: an analysis based on natural community screening results. BMC Cancer 2019;19:47.

9. Chen W, Li N, Cao M, et al. Preliminary Analysis of Cancer Screening Program in Urban China from 2013 to 2017. China Cancer 2020;29:1-6.

10. Li W, Zhao LZ, Ma DW, et al. Predicting the risk for colorectal cancer with personal characteristics and fecal immunochemical test. Medicine (Baltimore) 2018;97:e0529.

11. Wu WM, Wang Y, Jiang HR, et al. Colorectal Cancer Screening Modalities in Chinese Population: Practice and Lessons in Pudong New Area of Shanghai, China. Front Oncol 2019;9:399.

12. Chen H, Li N, Ren J, et al. Participation and yield of a population-based colorectal cancer screening programme in China. Gut 2019;68:1450-7.

13. Chen H, Lu M, Liu C, et al. Comparative Evaluation of Participation and Diagnostic Yield of Colonoscopy vs Fecal Immunochemical Test vs Risk-Adapted Screening in Colorectal Cancer Screening: Interim Analysis of a Multicenter Randomized Controlled Trial (TARGET-C). Am J Gastroenterol 2020;115:1264-74.

14. Shen L, Li Q, Wang W, et al. Treatment patterns and direct medical costs of metastatic colorectal cancer patients: a retrospective study of electronic medical records from urban China. J Med Econ 2020;23:456-63.

15. Zhao X, Wang X, Liu J, et al. Regional Differences of Quality Medical Resources in China Based on Different Scales. Economic Geography 2020;40:22-31.

16. Chen Z, Leng J, Liu Y, et al. Analysis on the effect of trans-provincial offset medical settlement policy on medical behavior and cost burden: An empirical analysis based on a cancer hospital in Beijing. Chinese Journal of Health Policy 2020;13:43-50.

17. Ferlay J, Ervik M, Lam F, et al. Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Accessed November 25, 2021. Available online: https://gco.iarc.fr/today

18. Yao HW, Li X, Cui L, et al. Annual report of Chinese Colorectal Cancer Surgery Database in 2019: A nationwide registry study. Chinese Journal of Practical Surgery 2020;40:106-10.

19. Liu JJ, Bellamy G, Barnet B, et al. Bypass of local primary care in rural counties: effect of patient and community characteristics. Ann Fam Med 2008;6:124-30.

20. Escarce JJ, Kapur K. Do patients bypass rural hospitals? Determinants of inpatient hospital choice in rural California. J Health Care Poor Underserved 2009;20:625-44.

21. Tai WT, Porell FW, Adams EK. Hospital choice of rural Medicare beneficiaries: patient, hospital attributes, and the patient-physician relationship. Health Serv Res 2004;39:1903-22.

22. Akin JS, Hutchinson P. Health-care facility choice and the phenomenon of bypassing. Health Policy Plan 1999;14:135-51.

23. Damrongplasit K, Wangdi T. Healthcare utilization, bypass, and multiple visits: the case of Bhutan. Int J Health Econ Manag 2017;17:51-81.

24. Borah BJ. A mixed logit model of health care provider choice: analysis of NSS data for rural India. Health Econ 2006;15:915-32.

25. Erlyana E, Damrongplasit KK, Melnick G. Expanding health insurance to increase health care utilization: will it have different effects in rural vs. urban areas? Health Policy 2011;100:273-81.

26. Yao J, Agadjanian V. Bypassing health facilities in rural Mozambique: spatial, institutional, and individual determinants. BMC Health Serv Res 2018;18:1006.
27. Rao KD, Sheffel A. Quality of clinical care and bypassing of primary health centers in India. Soc Sci Med 2018;207:80-8.

28. Li C, Chen Z, Khan MM. Bypassing primary care facilities: health-seeking behavior of middle age and older adults in China. BMC Health Serv Res 2021;21:895.

Cite this article as: Zhang JG, Wang H, Gu XF, Wang XY, Wang WJ, Du LB, Cao HL, Zhang X, Shi JH, Zhao YQ, Ma L, Liu YY, Huang JX, Cao J, Fan YP, Li L, Feng CY, Zhu Q, Du JC, Wang XH, Han BB, Qiao YL; China Working Group on Colorectal Cancer Survey. Status and associated factors of cross-regional healthcare-seeking among patients with advanced colorectal cancer in China: a multicenter cross-sectional study. Ann Transl Med 2022;10(6):342. doi: 10.21037/atm-22-1003