Does A Medical Consortium Influence Health Outcomes of Hospitalized Cancer Patients?

An Integrated Care Model in Shanxi, China

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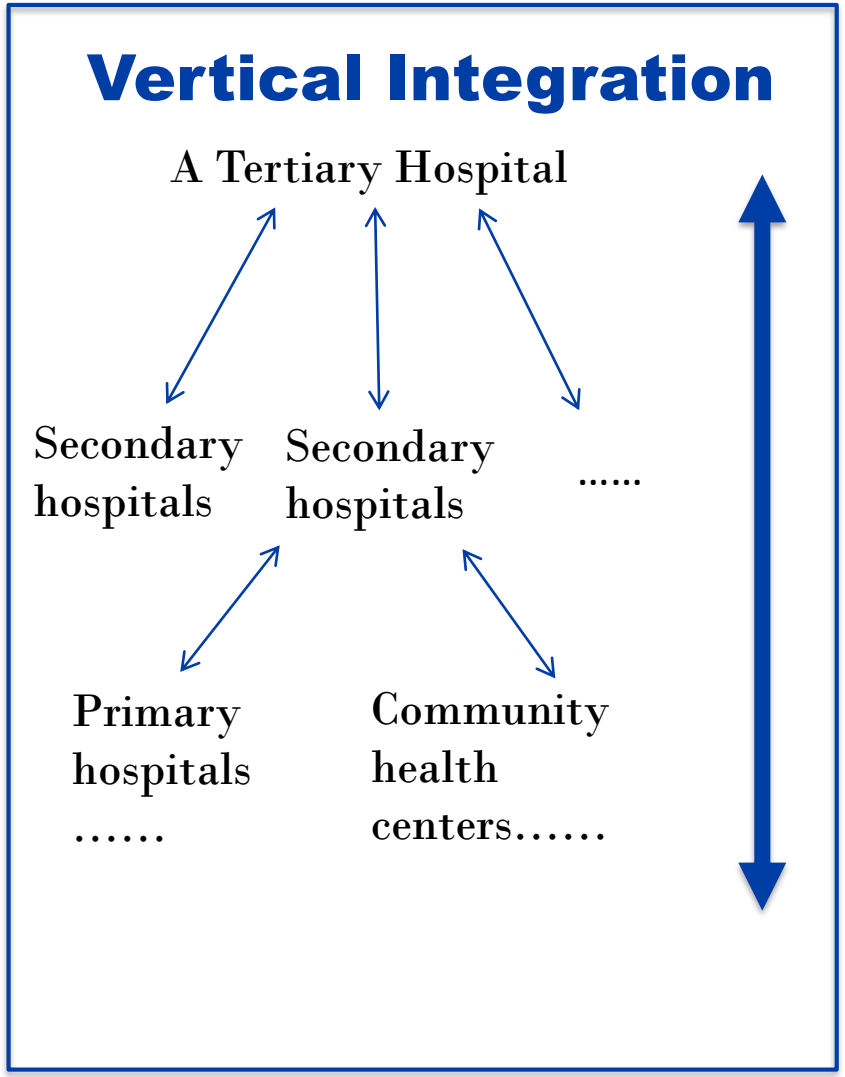
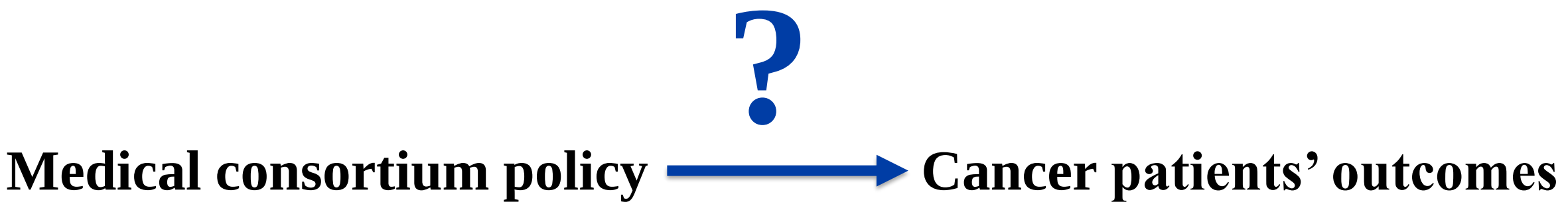
1. Background

- **A Medical Consortium** is a vertical integrated care that involves one widely recognized tertiary hospital and several secondary hospitals or community health centers.
- It aims to improve the outcomes of patients through the collaboration of different levels of medical care.

- June 2014 – Dec 2014: the Health and Family Planning Commission of Shanxi Province → the pilot of 10 medical consortiums



My question



Population

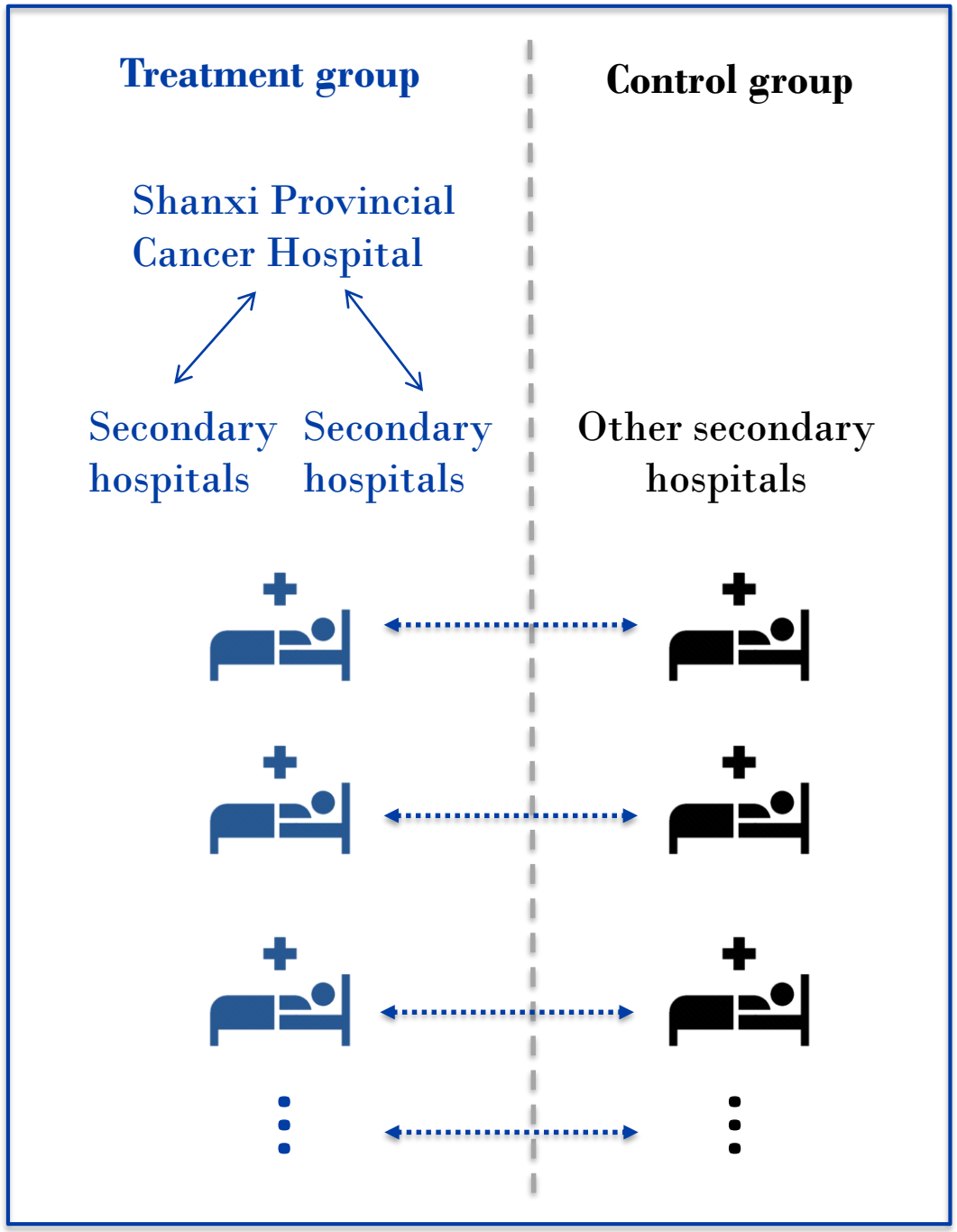
- **Cancer**: the leading cause of death in China
- Lung cancer, stomach cancer, and esophageal cancer → the most commonly diagnosed cancers in both men and women

- **Shanxi Provincial Cancer Hospital** → 15 secondary hospitals

- The aim of medical consortium policy is to improve the medical quality for secondary hospitals/community hospitals → maybe we should focus on patients in secondary hospitals

2. Data

- **Data**: Electronic medical records of lung cancer (n = 8193), stomach cancer (n = 5693) and esophagus cancer (n = 2802) patients hospitalized in secondary hospitals during January 2015 and December 2015
- **Sample matching**: Propensity scores were performed for one to one matching.
- After matching: 1598*2 for lung cancer, 1008*2 for stomach cancer and 451*2 for esophagus cancer



3. Statistical models

- **Outcome:** survival days in the hospitals and whether they are recovered or not
- **Kaplan-Meier survival curves**
- **Cox proportional hazard models** were used to estimate the hazard ratio of patients enrolled different categories of hospitals. Controlling variables include gender, age, comorbidities (C3 index), urgency of disease, and surgery.
- **Test of Assumptions**: the proportional hazards assumption was evaluated by the Empirical Score Process with cumulative sums of martingale-based residuals

3. Results

Figure 1. Product-Limit Survival Estimates of Matched Full Sample Patients

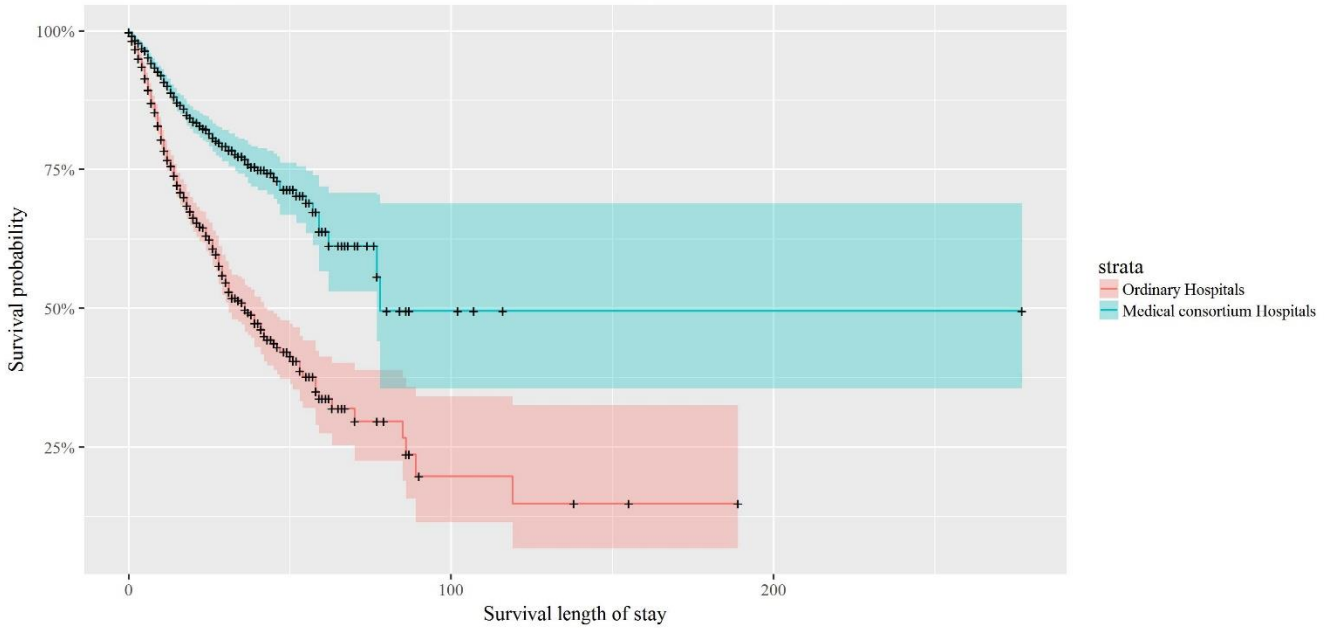
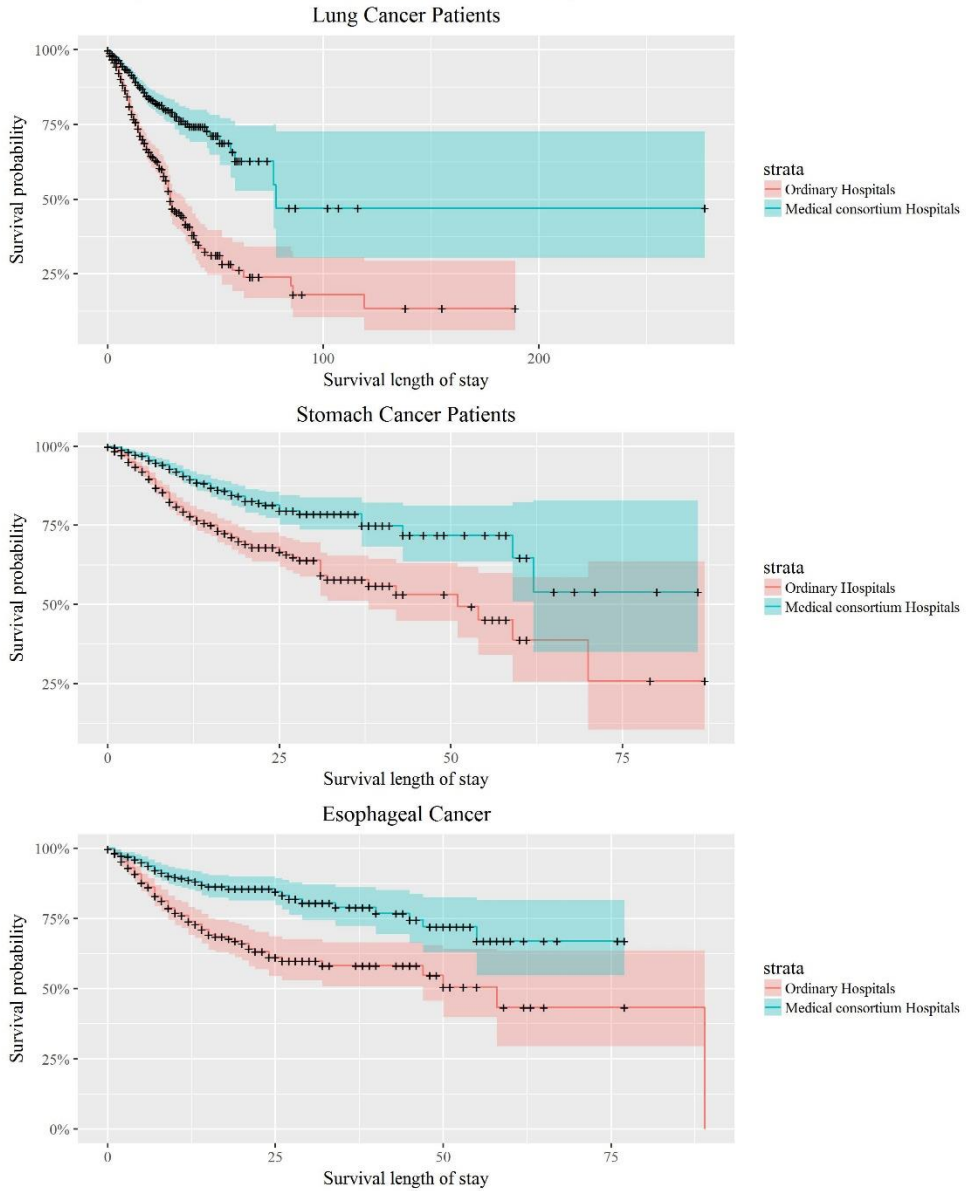


Figure 2. Product-Limit Survival Estimates of 3 Matched Cancer Patients



Note: strata = 0 denotes patients enrolled in non-Medical Consortium Hospitals, strata = 1 denotes patients enrolled in Medical Consortium Hospitals

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3. Results

- **Results**: significantly lower hazard ratios were consistently associated with cancer patients in medical consortium hospitals, compared with those in non-medical consortium hospitals.
- Lung cancer patients: hazard ratio = 0.405, $p < 0.001$
- Stomach cancer patients: HR = 0.406, $p < 0.001$
- Esophagus cancer patients: HR= 0.439, $p < 0.001$

What did they do?

- **The expert team** built specifically for this cancer medical consortium
- **Further education and specialized training** for doctors in secondary hospitals
- **The two-way referral system**

- The Shanxi Provincial Hospital has provided specialty consulting service for 320 cases, and guided 30 surgeries on the spot in consortium secondary hospitals by the end of March in 2015

Concerns

- For experts who intermittently work in secondary hospitals, how are they paid? Any incentives?
- For tertiary hospitals, are they really helping the secondary hospitals? Or they are just expanding their territories?
- Integrated care and market competition?

Conclusion

- The medical consortium provides an effective strategy to improve the outcomes of cancer patients in Shanxi, China.

Limitations

- No information on patients prior to the policy
- Length-of-stay in hospitals might be too short to assess their survival
- Only patients hospitalized one year after the policy intervention were included
- Patients might be transferred from tertiary hospitals. They have better outcomes because they received treatment from tertiary hospitals instead of the secondary hospitals.

Reference

- Cai, M., Liu, E., Tao, H., Qian, Z., Fu, Q. J., Lin, X., ... & Ni, Z. (2018). Does A Medical Consortium Influence Health Outcomes of Hospitalized Cancer Patients? An Integrated Care Model in Shanxi, China. *International Journal of Integrated Care*, 18:7. DOI: http://doi.org/10.5334/ijic.3588

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RESEARCH AND THEORY

Does A Medical Consortium Influence Health Outcomes of Hospitalized Cancer Patients? An Integrated Care Model in Shanxi, China

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Objective: To assess the effect of the medical consortium policy on the outcomes of cancer patients admitted to secondary hospitals in Shanxi, China.

Method: Electronic medical records of lung cancer (n = 8,193), stomach cancer (n = 5,693) and esophagus cancer (n = 2,802) patients hospitalized in secondary hospitals were used. Propensity score matching was used to match each patient enrolled in medical consortium hospitals with a counterpart admitted in non-medical consortium hospitals. Cox proportional hazard models were used to estimate the hazard ratio of patients enrolled different categories of hospitals.

Results: The hazards of lung, stomach and esophageal cancer patients admitted in medical consortium hospitals were consistently and significantly lower than those admitted in non-medical consortium hospitals after adjusting for a number of potential confounders. Lower hazard ratios were associated with lung (hazard ratio (HR) = 0.533, $p < 0.001$), stomach (HR = 0.494, $p < 0.001$), and esophagus (HR = 0.505, $p < 0.001$) cancer patients in medical consortium hospitals.

Conclusion: The medical consortium provides an effective strategy to improve the outcomes of cancer patients in Shanxi, China. The partnerships between top-tier hospitals and grassroots medical services bridge the gap in resources and plays a critical role in the quality of care in China.

Keywords: medical consortium; propensity score matching; the Cox proportional hazard model; cancer patients

Q & A

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