Benefits of Standardized Chronic Disease Management Programs on Comorbidity and Mortality in a Population-based Cohort in China

Presenter Di, Qian 底骞

Vanke School of Public Health, Tsinghua University, China

qiandi@tsinghua.edu.cn

27/09/2024

WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024

What are the health benefits of basic public health service?

- In many countries, basic public health services are provided to residents
  - U.S.: 10 essential public health services
  - China: 12 basic public health services, including hypertension and type 2 diabetes management, healthcare for elder people, pregnant women…
  - In China, government pays 89 yuan (12.4 dollars/11.6 euros) per person per year.
- What are the health benefits of providing public health services?

目　录

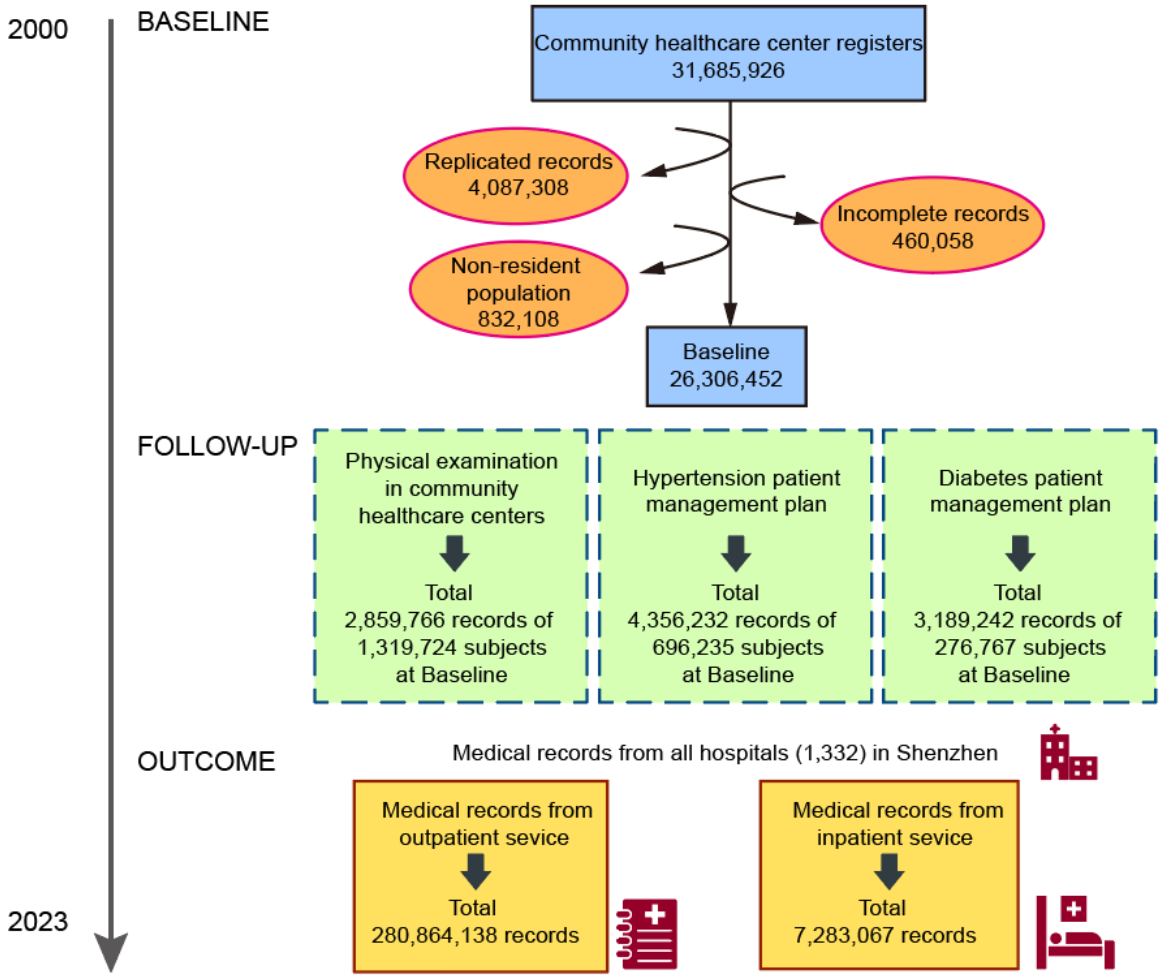
The Futures Initiative: the 10 Essential Public Health Services
Aligning the 10 Essential Public Health Services and the Foundational Public Health Services
September 2020

field for the field and describe core elements of public health practice. There is significant alignment between the two as outlined in the following tables and the relevant components of each foundational capability and area (which may relate to more than one Essential Service) are included and aligned with the corresponding EPHS. Table 1 provides an overview of alignment at the statement level and Table 2 provides more details on the components of each foundational capability and area.

Table 1. Alignment Summary

ES	Revised EPHS	Foundational Capability	Foundational Area
1	Assess and monitor population health status, factors that influence health, and community needs and assets	– Assessment/Surveillance – Emergency Preparedness and Response	– Chronic Disease and Injury Prevention – Communicable Disease Control – Environmental Public Health – Maternal, Child, and Family Health
2	Investigate, diagnose, and address health problems and hazards affecting the population	– Assessment/Surveillance – Emergency Preparedness and Response	– Chronic Disease and Injury Prevention – Communicable Disease Control – Environmental Public Health – Maternal, Child, and Family Health
3	Communicate effectively to inform and educate people about health, factors that influence it, and how to improve it	– Communications – Emergency Preparedness and Response	– Chronic Disease and Injury Prevention – Communicable Disease Control – Environmental Public Health – Maternal, Child, and Family Health
4	Strengthen, support, and mobilize communities and partnerships to improve health	– Community Partnership Development	– Chronic Disease and Injury Prevention – Communicable Disease Control – Environmental Public Health – Maternal, Child, and Family Health
5	Create, champion, and implement policies, plans, and laws that impact health	– Policy Development and Support	– Chronic Disease and Injury Prevention – Communicable Disease Control – Environmental Public Health – Maternal, Child, and Family Health

Overall Framework and Descriptive Statistics of the Shenzhen Cohort

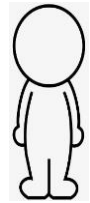


- Confirming the baseline through Integrating community health center data and hospital data
- Obtaining follow-up records of the population under Hypertension and Type 2 Diabetes Management Programs
- Ascertaining outcomes through medical diagnosis data

Topic: Can Hypertension and Type 2 Diabetes Management policies reduce the risk for comorbidity and mortality?

Population: Newly diagnosed hypertension (total 701,759 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with new chronic diseases.



NO Hypertension and Type 2 Diabetes Management

Hypertension and Type 2 Diabetes Management

?

?

Topic: Can Hypertension and Type 2 Diabetes Management policies reduce the risk for comorbidity and mortality?

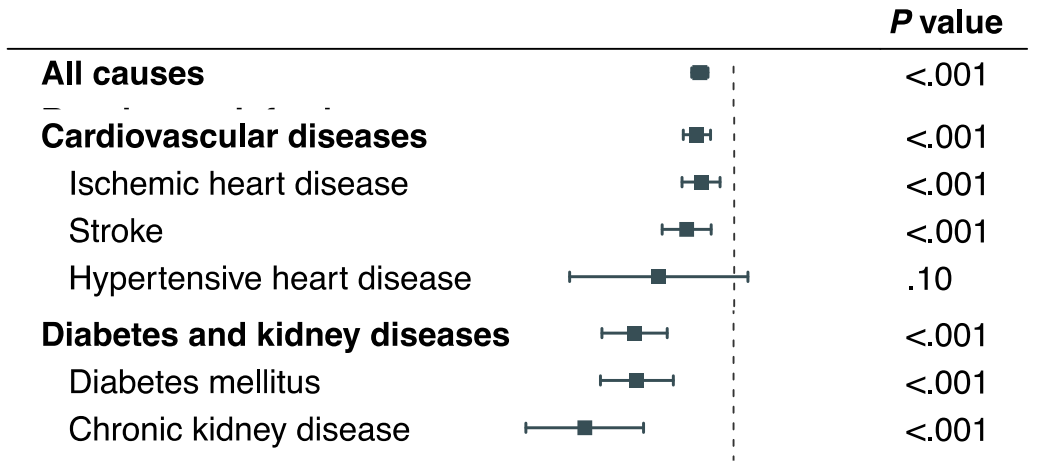
Population: Newly diagnosed hypertension (total 701,759 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with new chronic diseases.

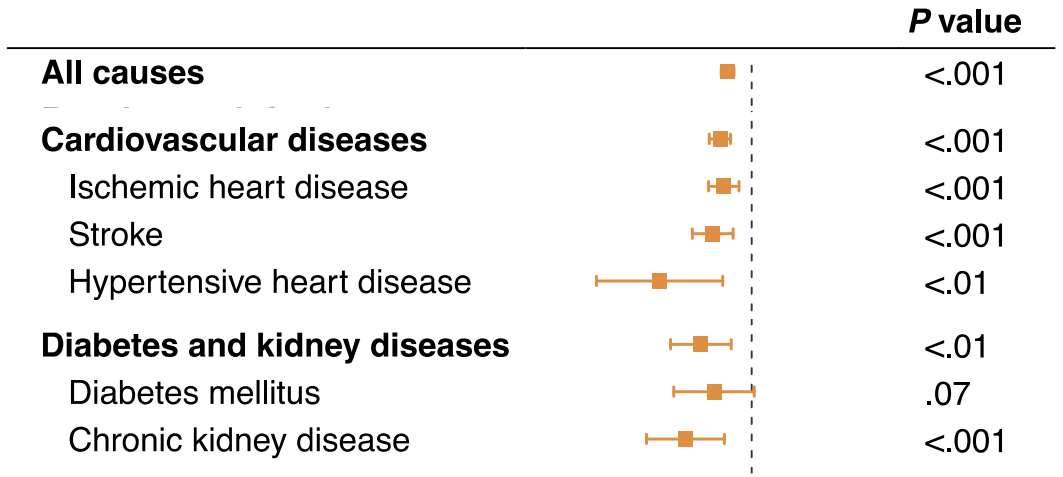
Result: Both Hypertension and Type 2 Diabetes Health Management Program can significantly reduce mortality from all causes and specific causes.

Enrolled in the Hypertension and Type 2 Diabetes Health Management Program lowered the risk of death from all causes by 20% (HR, 0.80; 95% CI, 0.75-0.85) and 27% (95% CI, 0.68-0.79), respectively.
We also found significant associations between the enrollment and declined mortality from cardiovascular diseases, and diabetes and kidney diseases.

A. Type 2 Diabetes



B. Hypertension



Topic: Can Hypertension and Type 2 Diabetes Management policies reduce the risk for comorbidity and mortality?

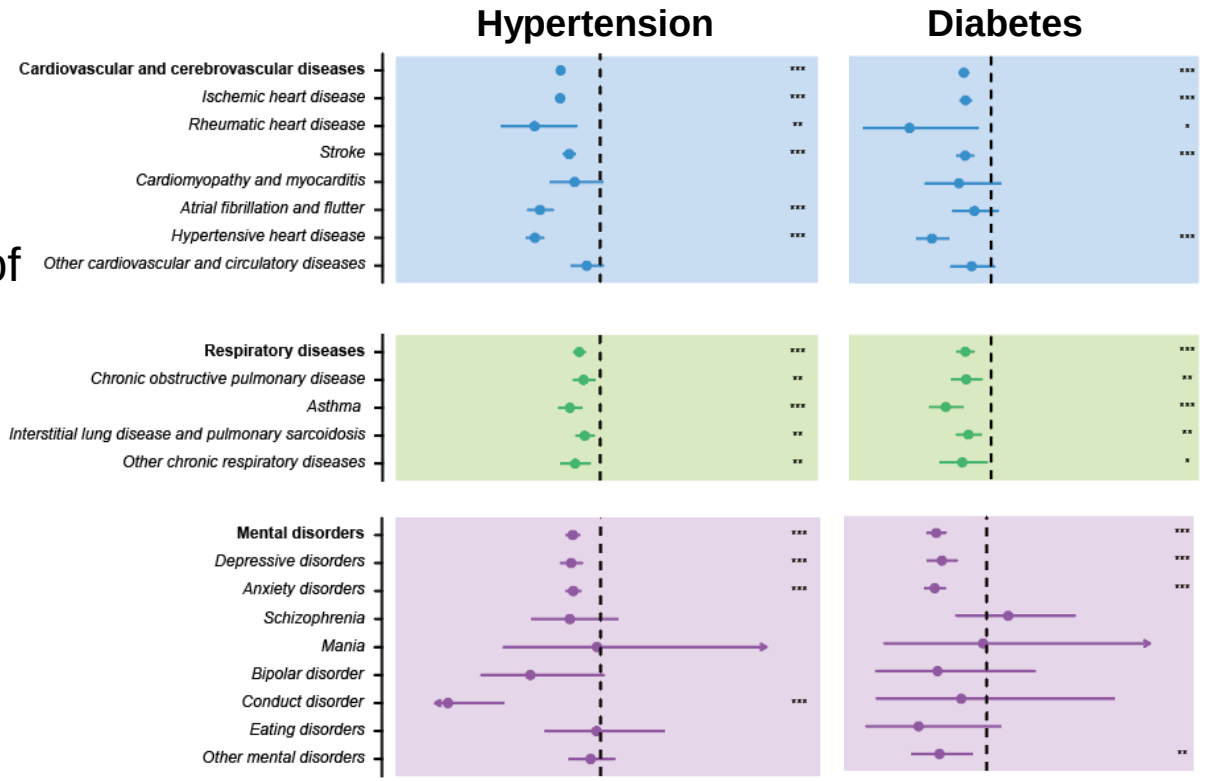
Population: Newly diagnosed hypertension (total 701,759 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with new chronic diseases.

Result: Both Hypertension and Type 2 Diabetes Health Management Program can significantly reduce incidence of comorbidity with other new diseases.

Among 84 chronic disease outcome we identified, Hypertension Management reduced comorbidity risk of 28 diseases and Type 2 Diabetes Management reduced comorbidity risk of 25 diseases.

Population	Hypertension HR (95% CI)	Diabetes HR (95% CI)
All population		
Comorbidity with one new disease	0.95 (0.94–0.96) ***	0.94 (0.93–0.95) ***
Comorbidity with two new diseases	0.94 (0.93–0.96) ***	0.93 (0.91–0.95) ***
Comorbidity with three new diseases	0.95 (0.94–0.97) ***	0.92 (0.89–0.94) ***
Comorbidity with four new diseases	0.95 (0.93–0.97) ***	0.91 (0.88–0.94) ***
Comorbidity with five new diseases	0.94 (0.91–0.97) ***	0.92 (0.88–0.96) ***



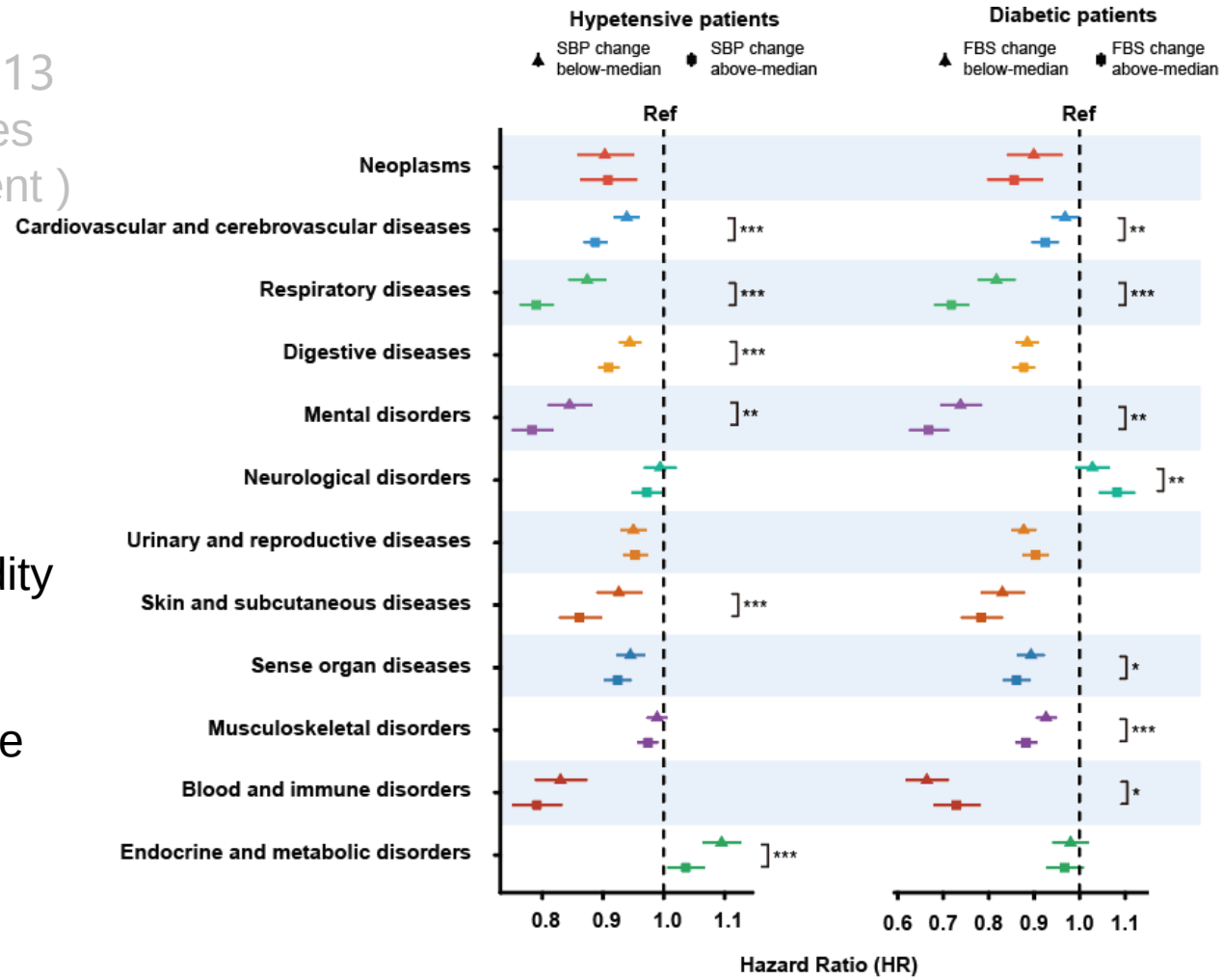
Topic: Can hypertension and diabetes management policies reduce the risk for multiple chronic diseases?

Population: Newly diagnosed hypertension (total 702,913 subjects, 231,340 included in management) and diabetes (total 325,117 subjects, 105,591 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with new chronic diseases.

Result: Both hypertension and diabetes health management program can significantly reduce comorbidity risk with other new chronic diseases.

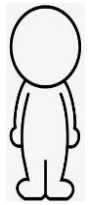
Hypertensive patients with well-controlled blood pressure and type 2 diabetic patients with well-controlled fasting blood glucose benefited more from the management.

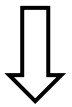


Topic: Can specific interventions in Hypertension and Type 2 Diabetes Management reduce the risk for comorbidity and mortality?

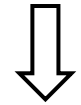
Population: Newly diagnosed hypertension (total 701,759 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with other new diseases.

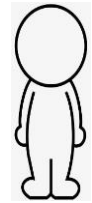


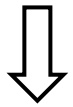


NO Hypertension and Type 2 Diabetes Management



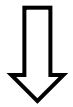
?





Hypertension and Type 2 Diabetes Management

Smoking intervention
Drinking intervention
Physical activity intervention
Diet intervention
Medication intervention
Psychology intervention
Adherence intervention



?

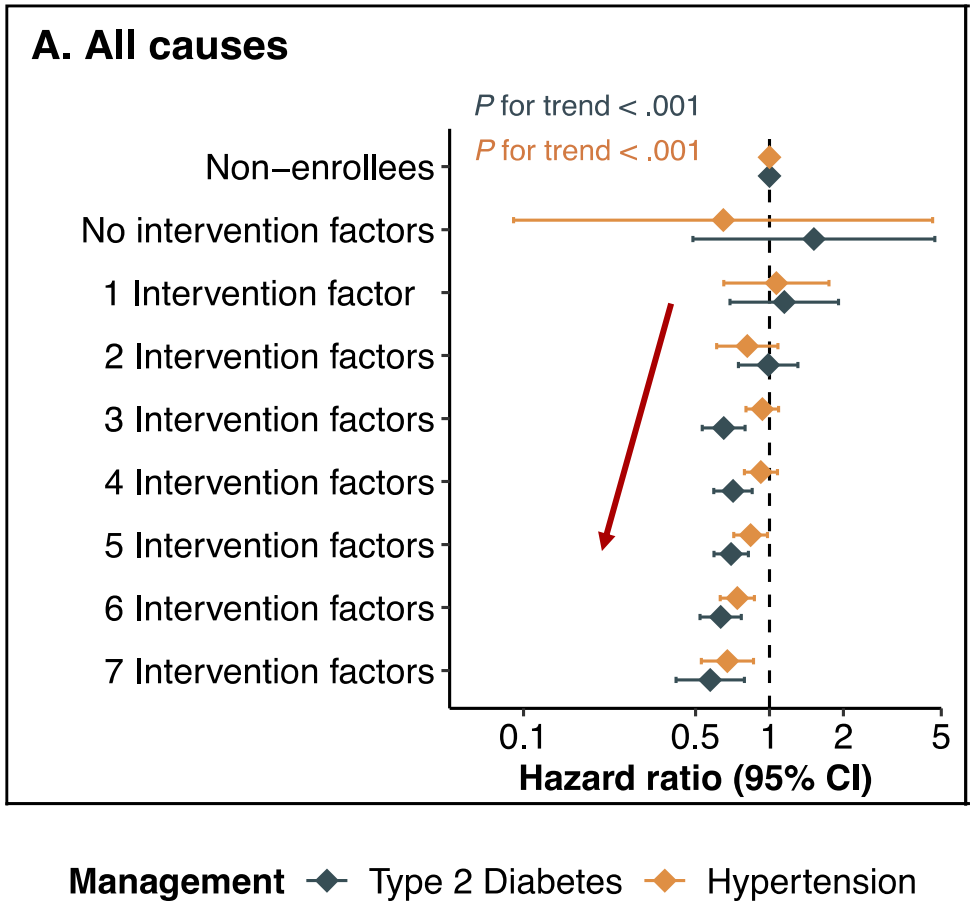
Topic: Can specific interventions in Hypertension and Type 2 Diabetes Management reduce the risk for comorbidity and mortality?

Population: Newly diagnosed hypertension (total 701,759 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with other new diseases.

Result: With increasing number of interventions with target achieved, we found stepwise reductions of mortality from all causes in a dose-response manner among type 2 diabetic and hypertensive enrollees, compared to non-enrollees.

For type 2 diabetic patients, three or more interventions with target achieved were required to significantly reduce mortality; while for hypertension, five or more were needed.



Topic: Can specific interventions in Hypertension and Type 2 Diabetes Management reduce the risk for comorbidity and mortality?

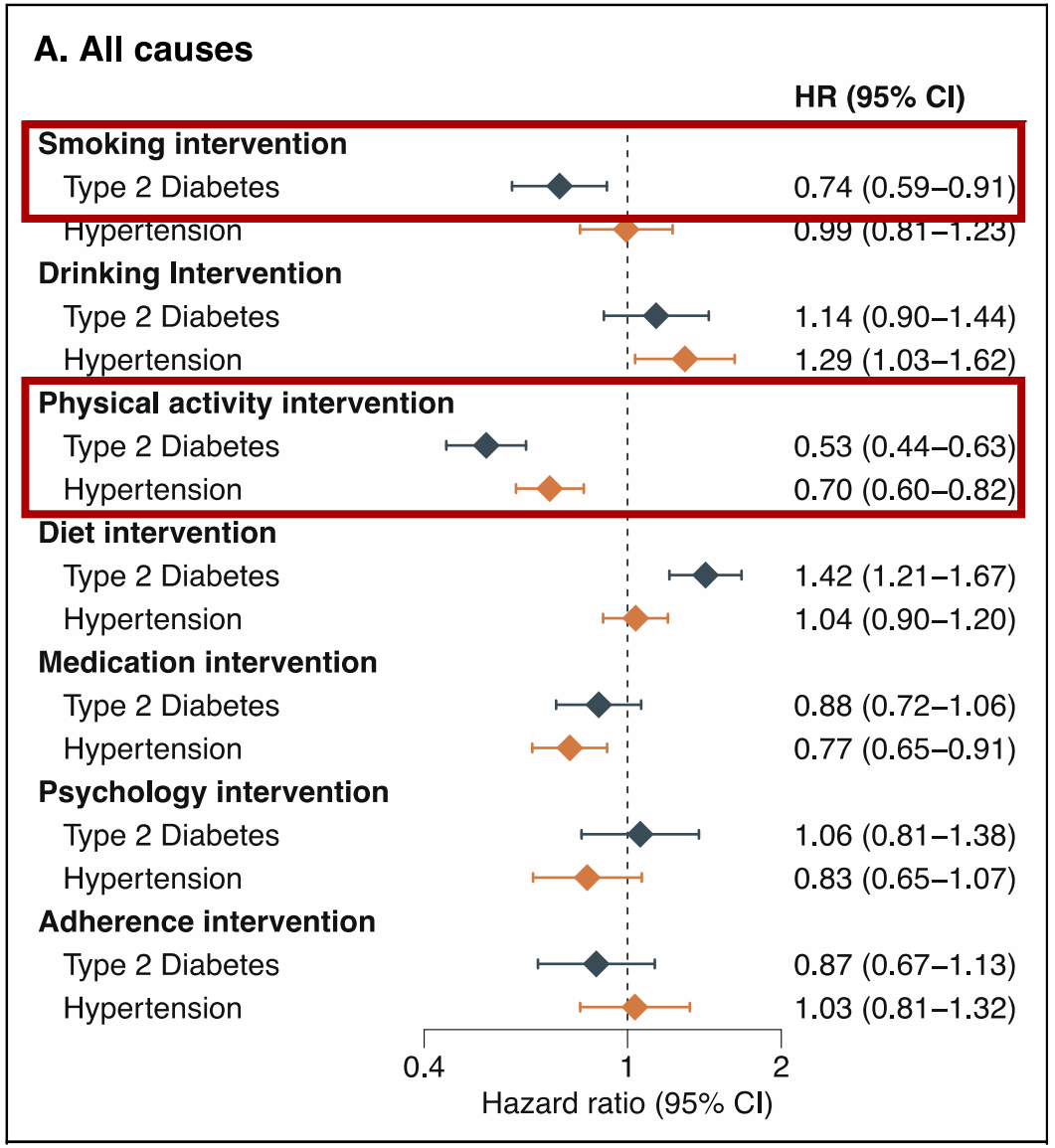
Population: Newly diagnosed hypertension (total 701,759 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

Outcome: Mortality / comorbidity risk with other new diseases.

Result:

Physical activity intervention with target achieved lowered the risk of death from all causes (HR, 0.53; 95% CI, 0.44-0.63) among type 2 diabetic patients, and death from all causes (HR, 0.70; 95% CI, 0.60-0.82) among hypertensive patients.

Smoking intervention with target achieved significantly reduced the risk of all-cause mortality (HR, 0.74; 95% CI, 0.59-0.91) among type 2 diabetic patients.



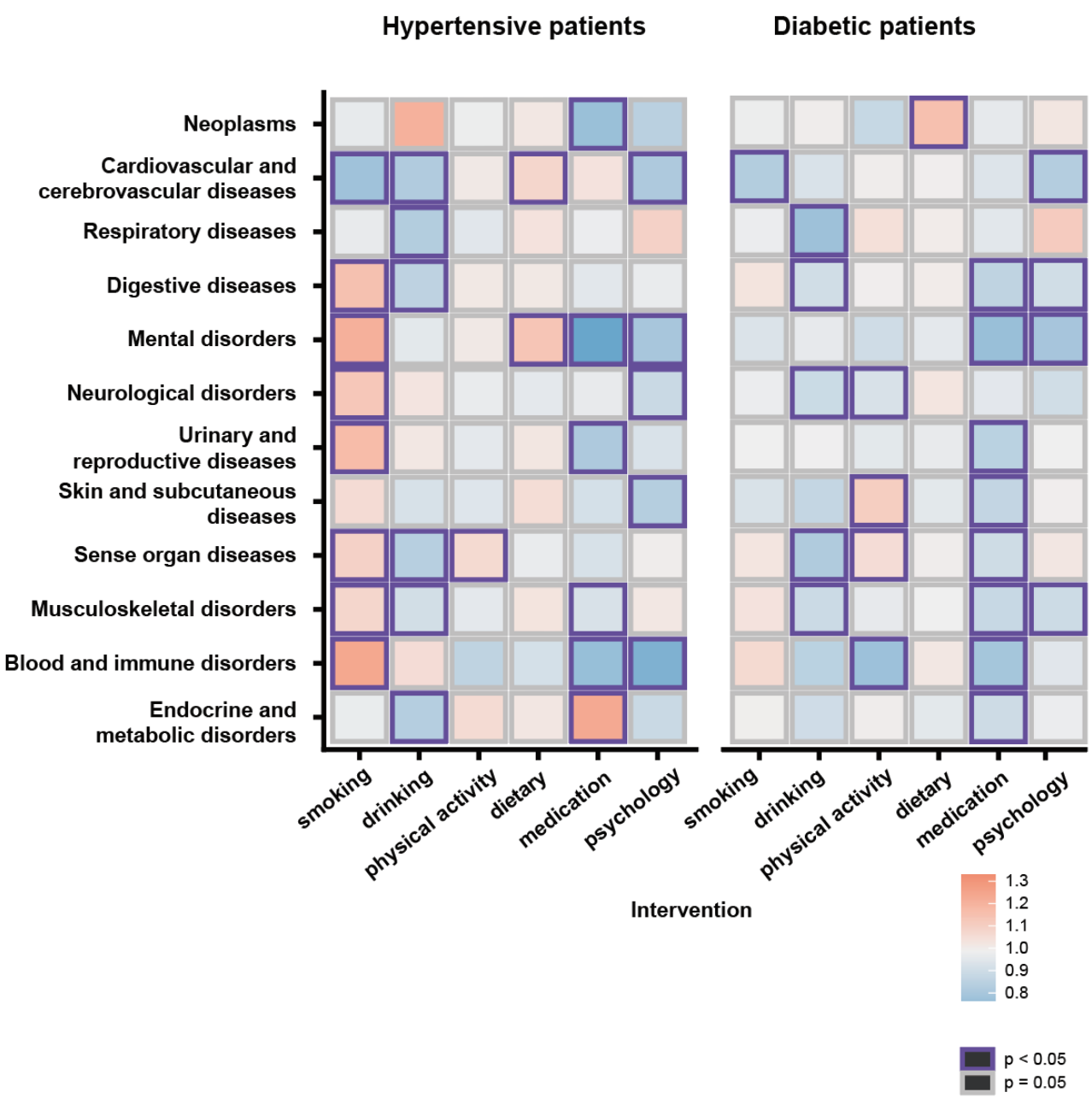
Topic: Can specific interventions in Hypertension and Ty 2 Diabetes Management reduce the risk for comorbidity mortality?

Population: Newly diagnosed hypertension (total 701,7 subjects, 231,352 included in management) and type 2 diabetes (total 320,179 subjects, 105,593 included in management) patients from 2018 to 2023.

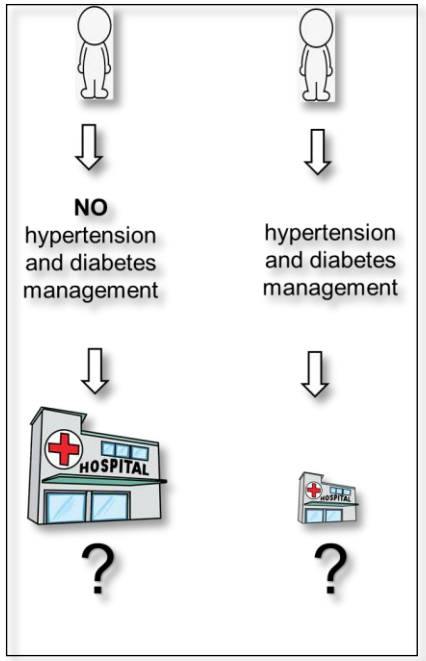
Outcome: Mortality / comorbidity risk with other new diseases.

Result:

Smoking intervention reduced the comorbidity risk of cardiovascular and cerebrovascular diseases, while increasing risks of other diseases among hypertensive patients. Drinking intervention, medication adherence intervention and psychology intervention showed comprehensive health effects for both hypertensive and type 2 diabetic patients.



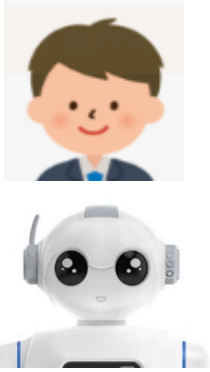
Open Data Sharing Platform to Academic



Data visit

Data integration

Data cleaning



Data storage & security

Fire wall

Acknowledgements

Support from the National Natural Science Foundation of China

Qian Di lab, Tsinghua University

Key messages

- Standardized chronic disease management program can significantly reduce all-cause mortality, cause-specific mortality, and incidences of comorbidity with other new diseases
- Well-controlled patients have better health outcomes than people who do not
- Patients who completed more lifestyle interventions had greater mortality reductions
- Empirical evidence for basic public health service
- Open platform to all researchers in the future

Thank you for listening

Presenter Di, Qian 底骞

Vanke School of Public Health, Tsinghua University, China

qiandi@tsinghua.edu.cn

27/09/2024

WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024