Regional Practice Variation in **Diabetic care**: A Perspective of Care Quality

Sanghyun Cho

Authors & Grant Information

- Ji-Yeon Shin; Jin Yong Lee; Hyun Joo Kim; Sang Jun Eun; Sanghyun Cho; Sookyung Park; Yoon Kim

- This research was funded by Korean National Health Insurance Service. Authors of this research DO NOT have any financial or non-financial conflicts of interest.

Diabetes

- 422 million adults living with diabetes in 2014
- Prevalence : 4.7% (1980) > 8.5% (2014)
- US$827 billion spent related to diabetes in 2014
- 1.5 million death caused by diabetes and 8th leading cause of death in 2012
- Additional 2.2 million death due to higher than optimal blood glucose

- A life course perspective is essential for preventing diabetes

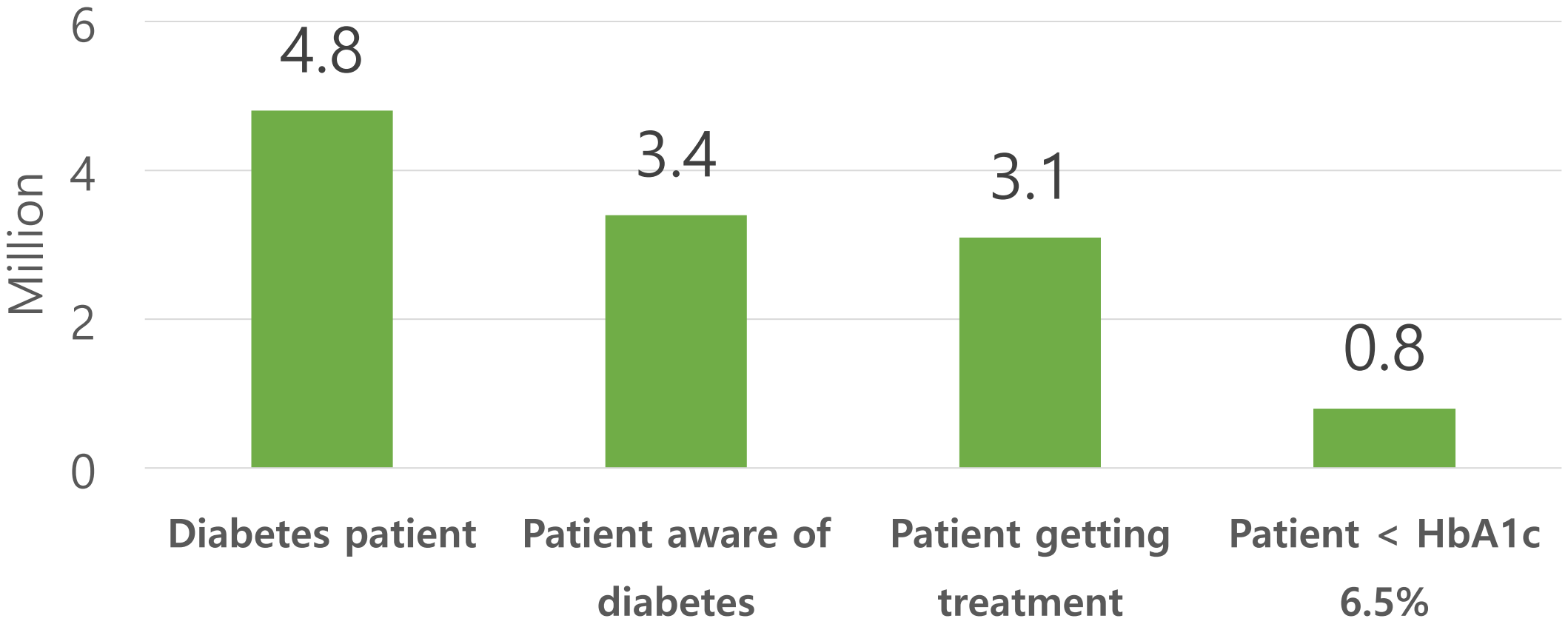
-World Health Organization. (2016). Global Report on Diabetes. Geneva: World Health Organization; 2016.

Diabetes in South Korea

- 4.8 million (13.7%) adults living with diabetes in 2014
- 30% of patient does not aware of their condition
- 10% remained untreated
- HbA1c control : 23.3% of patients < 6.5%(43.5% of patients <7.0%)
- Leading cause of premature death and non fatal-outcome

-Yoon, J., Seo, H., Oh, I. H., & Yoon, S. J. (2016). The Non-Communicable Disease Burden in Korea: Findings from the 2012 Korean Burden of Disease Study. *Journal of Korean medical science*, *31*(Suppl 2), S158-S167.
-Korean Diabetes Association. (2016). Diabetes Fact Sheet in Korea 2016, International Conference on Diabetes and Metabolism 2016

Diabetes in South Korea



Backgrounds

- Previous research focus about diabetes in South Korea was
  - Disease awareness
  - Self management
  - Effectiveness of a program
- Lack of the research on the quality of diabetes care and its geographic variation

Objectives

- To evaluate the quality of diabetes care in Korea and to reveal its geographic variations

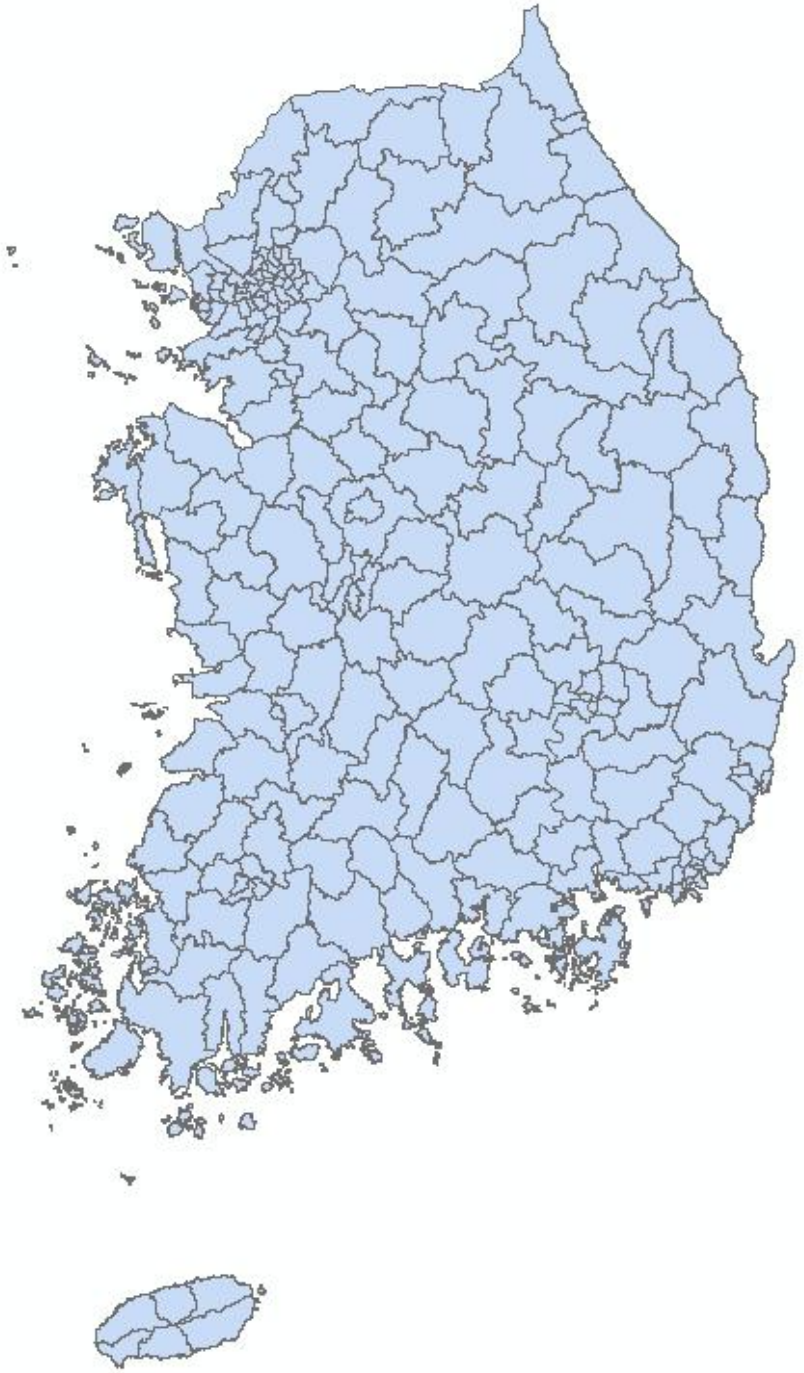
Methods

- Data : National Health Insurance
  - Claims data of 2010 and 2014
  - Health promotion data of 2010 and 2014

- Study population
  - Patients with diabetes code (E11) either as a principal or secondary diagnosis

Methods

- Unit of analysis : **251** Districts
  - Population size : 10,000 ~ 600,000
  - Area : 3㎢ ~ 1,800㎢



Methods – Quality indicators

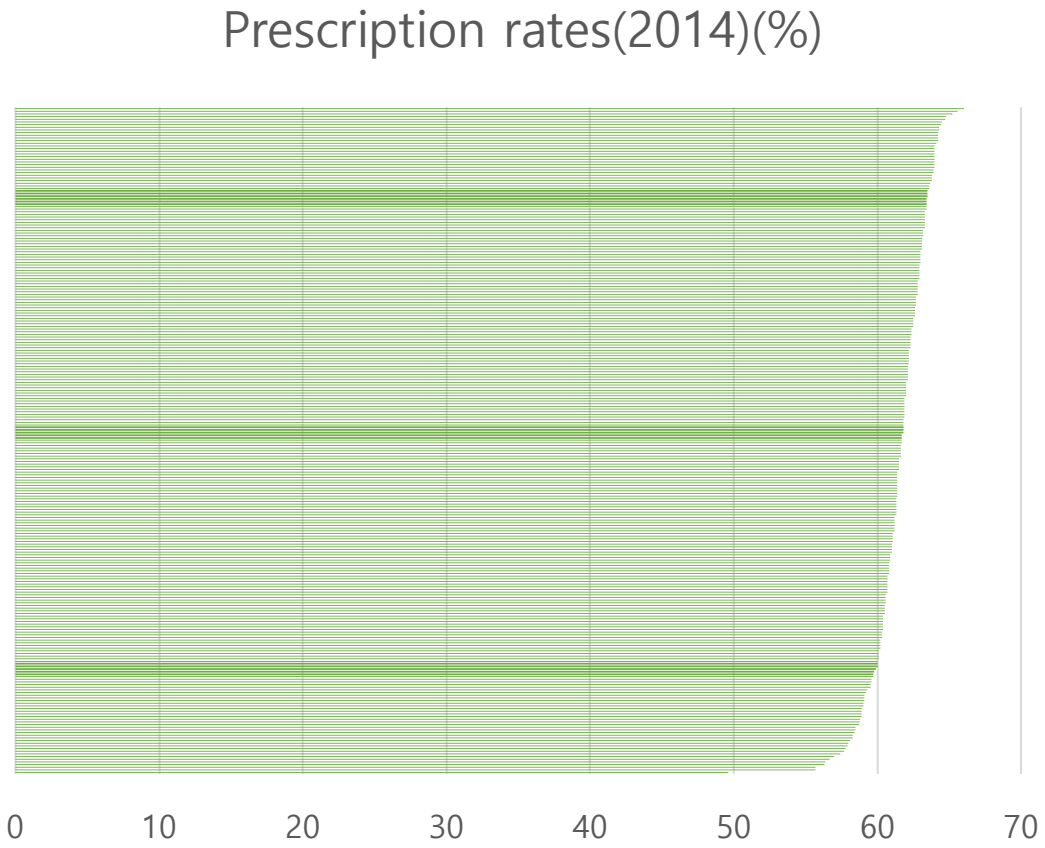
Domain	Indicator
Continuity of Care	Prescription rates
Process of Care	HbA1c testing, LDL cholesterol testing, Nephropathy screening, Eye examination
Intermediate Outcome	LDL cholesterol level: controlled if less than 100 mg/dL Blood pressure: controlled if less than 140/80 mmHg HbA1c level
Final Outcome	Lower extremity amputation, Kidney disease, Cardiovascular mortality

-Ana Johnson, Therese A. Stukel. (2016). Medical Practice Variation, Springer
-Korean Diabetic Association. (2015). Treatment Guideline for Diabetes.

Results – Quality of care

Indicators	2010		2014		National Diabetes Audit(2015-16)
	Average(%)	Coefficient of variation	Average(%)	Coefficient of variation	National Achievement
Prescription rates	65.3	0.04	61.5	0.03	
HbA1c testing	55.1	0.13	68.7	0.09	92.6
LDL cholesterol testing	54.9	0.10	62.3	0.09	92.2
Nephropathy screening	10.0	0.36	16.2	0.24	72.5
Eye examination	2.9	0.43	3.3	0.44	79.1
Controlled LDL cholesterol	40.1	0.09	45.7	0.08	77.1
Controlled blood pressure	66.9	0.07	67.7	0.08	73.6

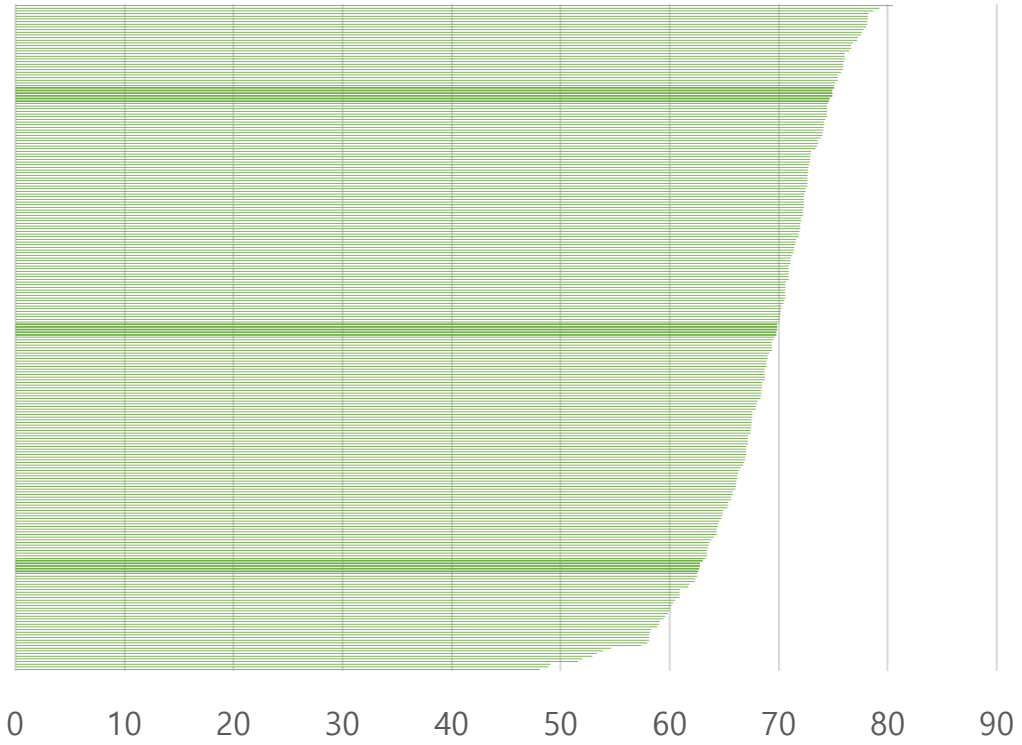
Results – Continuity of care



- Lowest: 49.6
- Highest: 66.0
- 90percentile/10percentile ratio: 1.08(63.8/58.9)

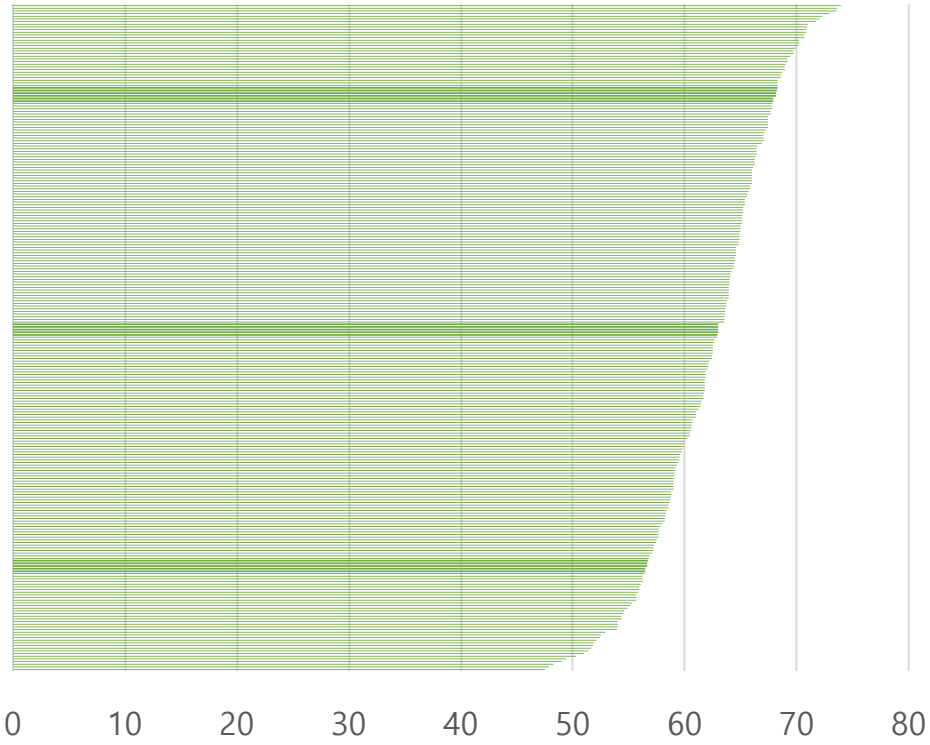
Results – Process of care

HbA1c testing(2014)(%)



- Lowest: 48.1 Highest: 80.5
- 90percentile/10percentile ratio: 1.25(75.4/60.1)

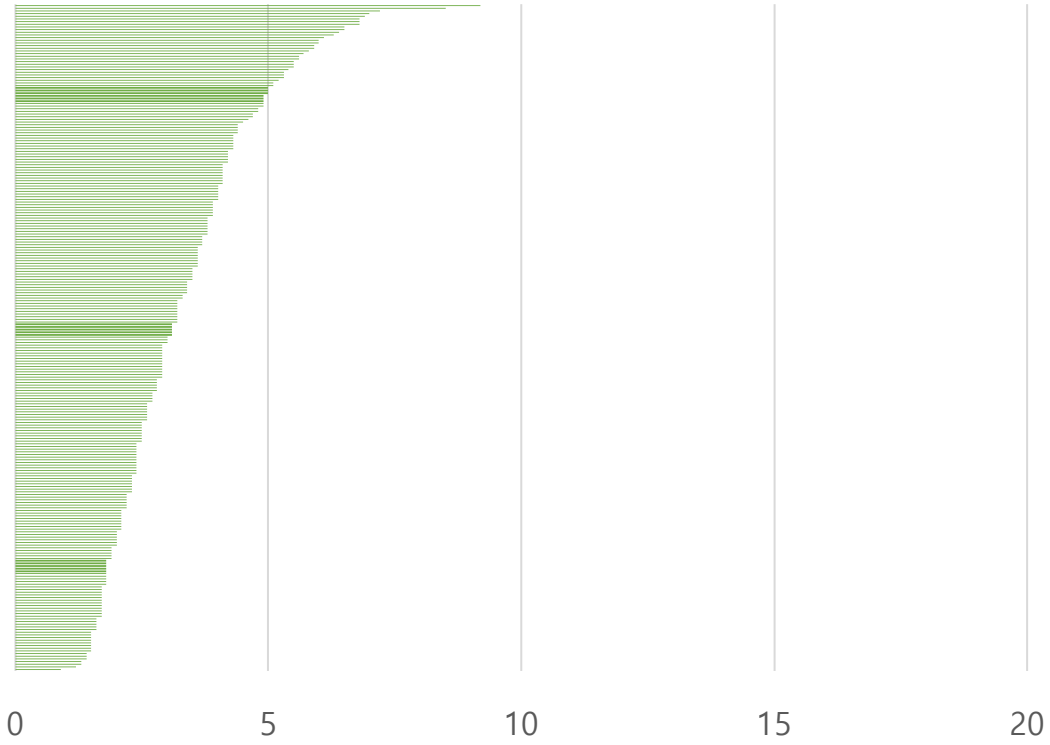
LDL cholesterol testing(2014)(%)



- Lowest: 47.5 Highest: 73.9
- 90percentile/10percentile ratio: 1.25(68.5/54.9)

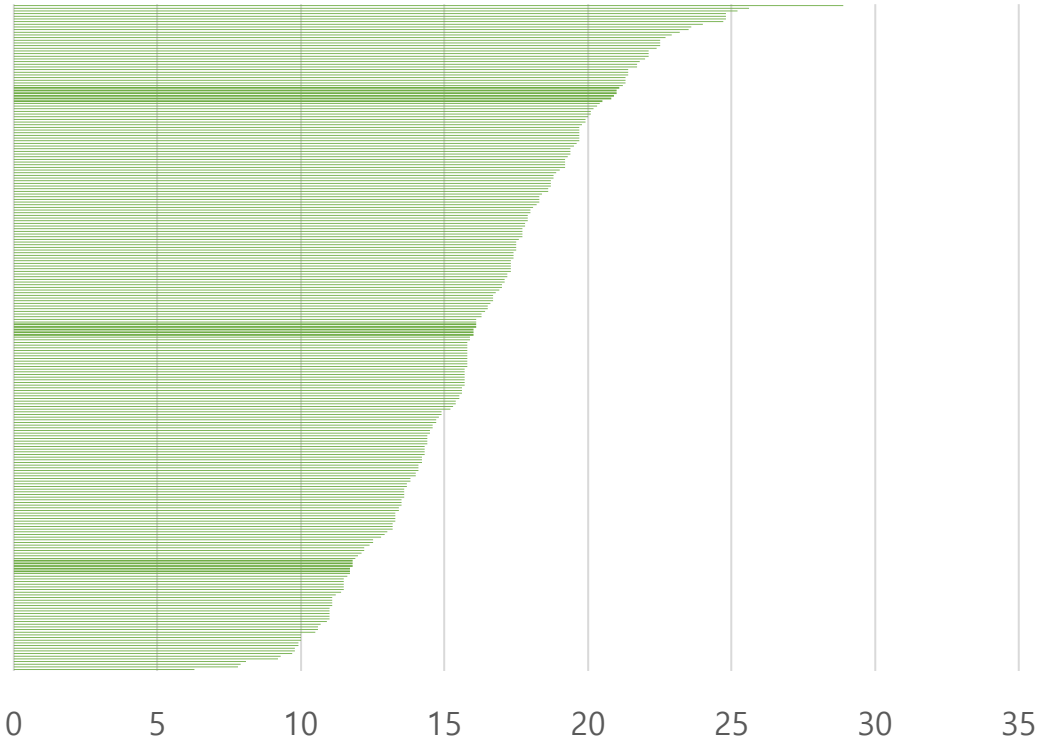
Results – Process of care

Eye examination(2014)(%)



- Lowest: 0.9 Highest: 9.2
- 90percentile/10percentile ratio: 3.12(5.3/1.7)

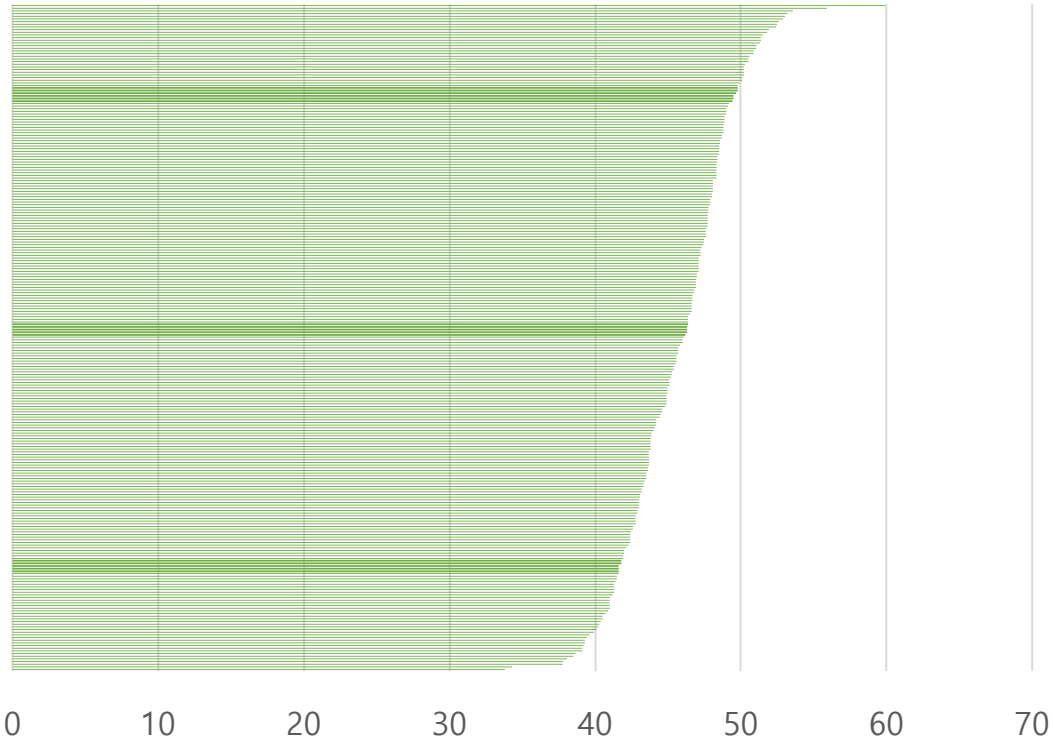
Nephropathy screening(2014)(%)



- Lowest: 6.3 Highest: 28.9
- 90percentile/10percentile ratio: 1.94(21.3/11)

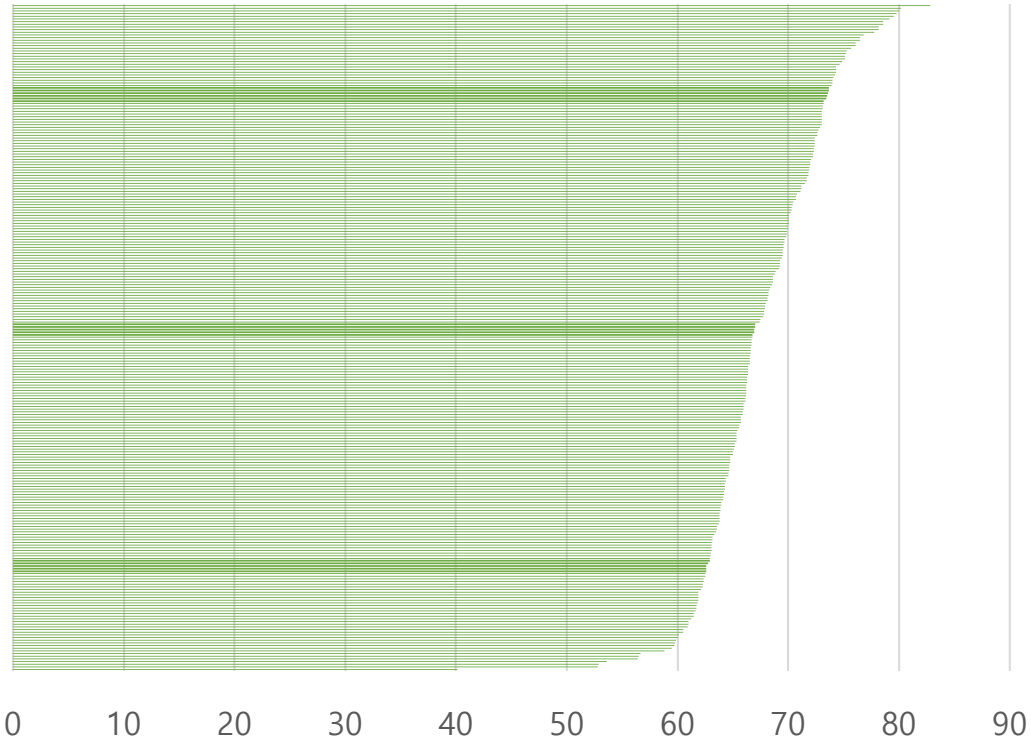
Results – Intermediate outcome

Controlled LDL cholesterol(2014)(%)



- Lowest: 33.8 Highest: 55.9
- 90percentile/10percentile ratio: 1.22(50.1/41)

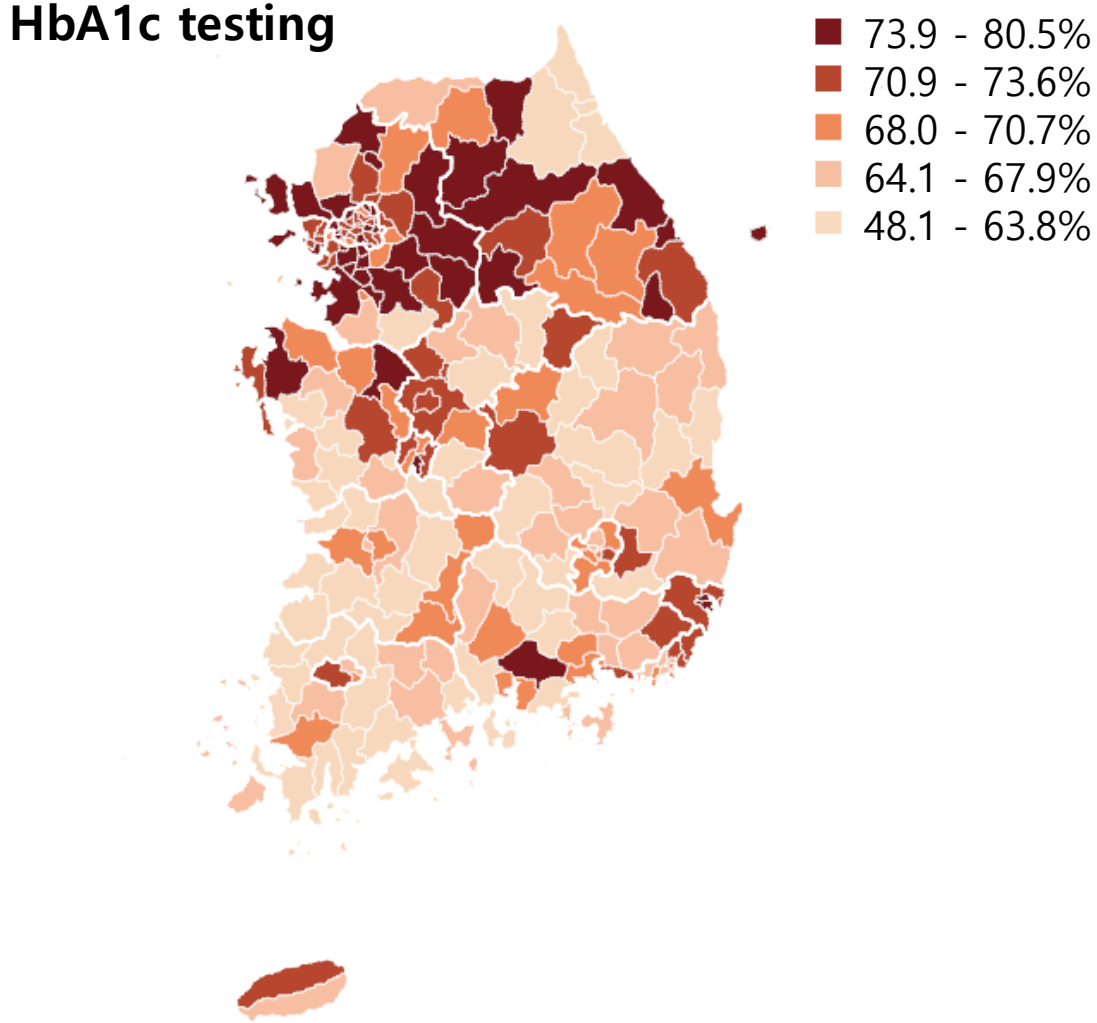
Controlled blood pressure(2014)(%)



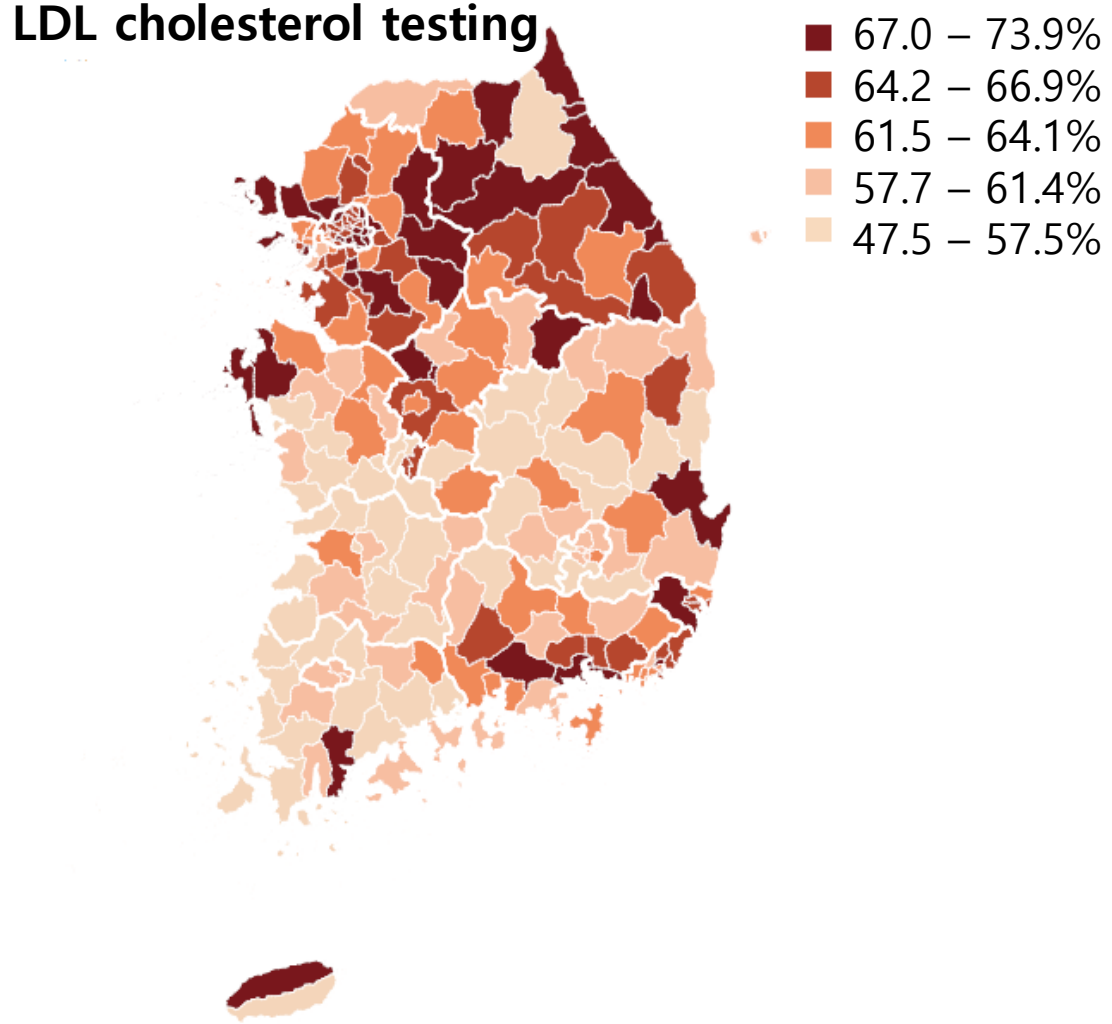
- Lowest: 40.1 Highest: 61.7
- 90percentile/10percentile ratio: 1.20(74.1/61.7)

Results – Regional variation(2014)

HbA1c testing

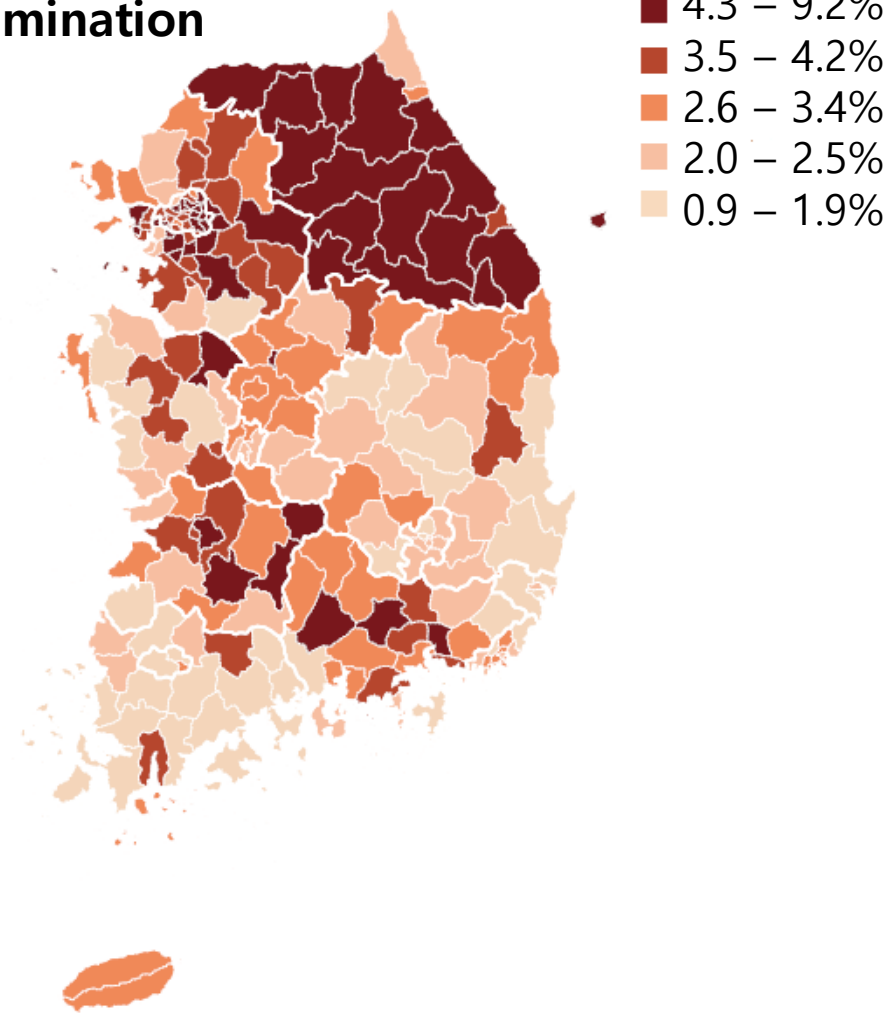


LDL cholesterol testing

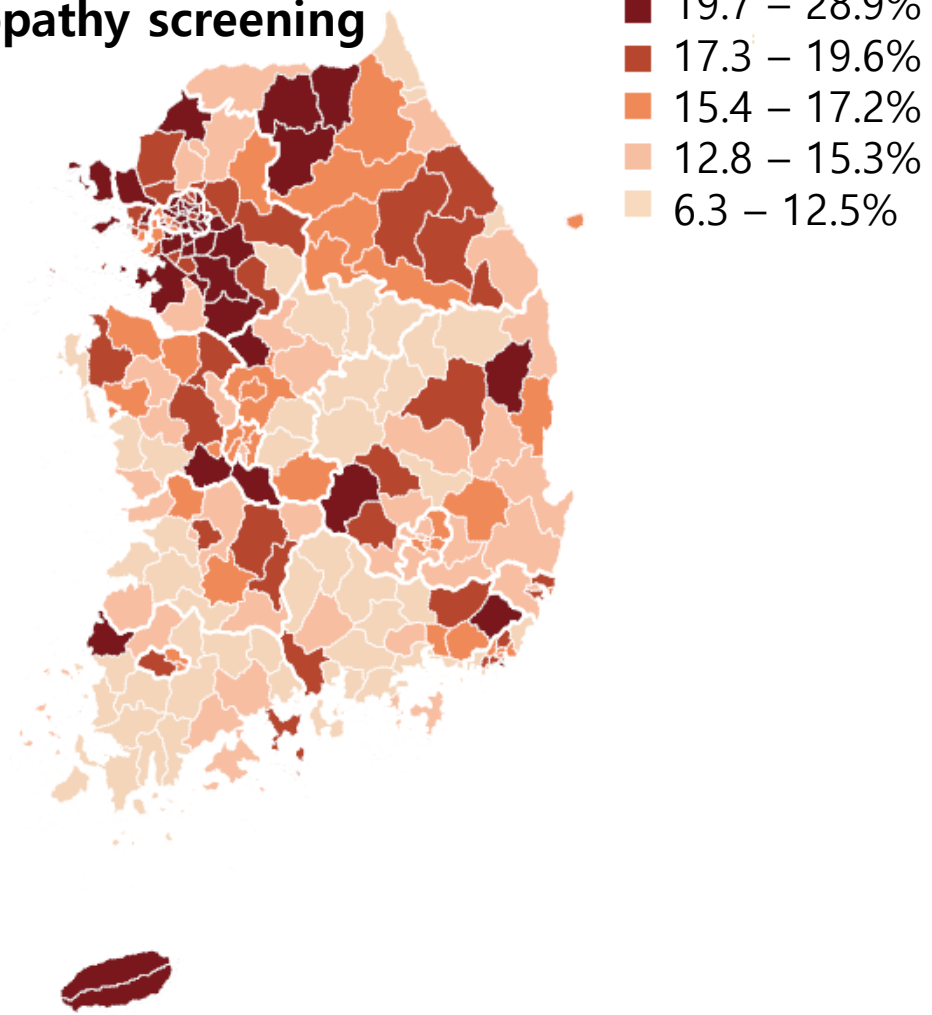


Results – Regional variation(2014)

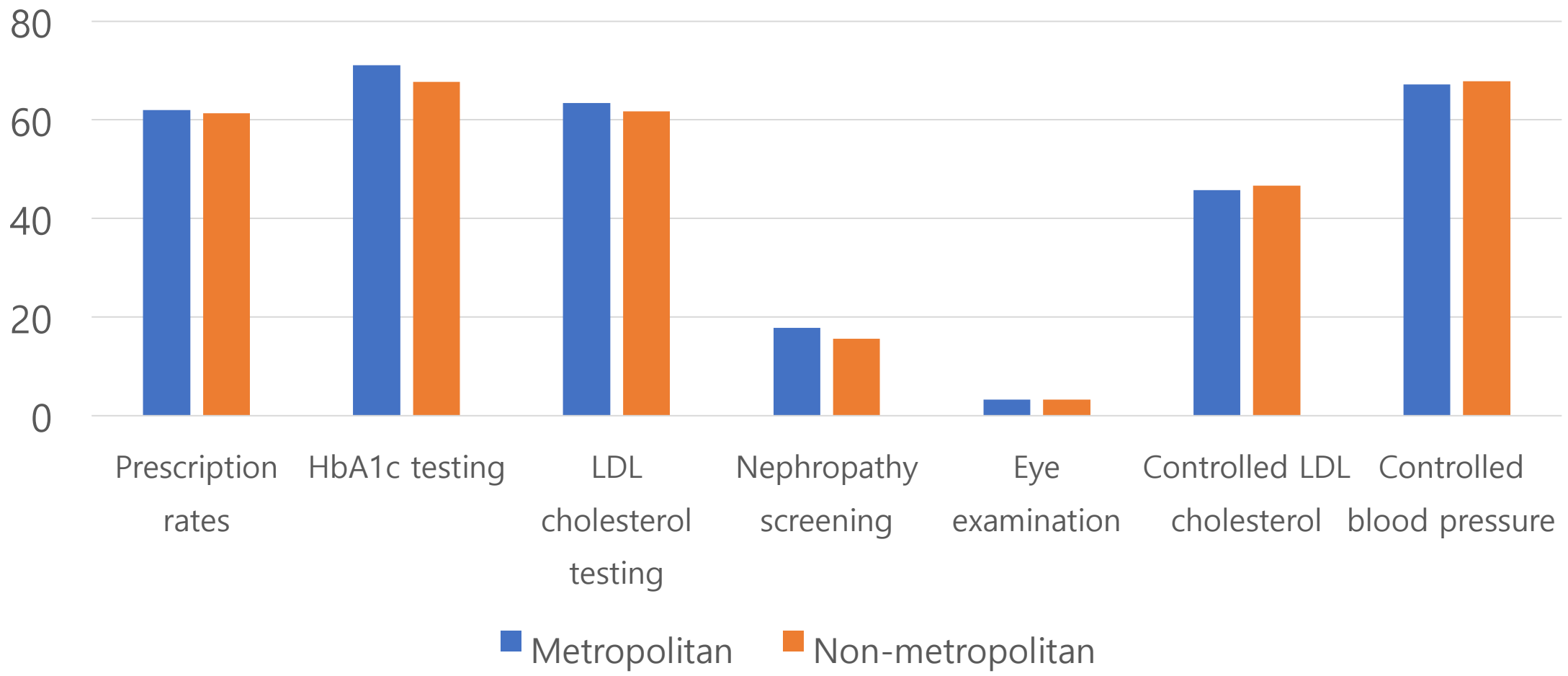
Eye examination



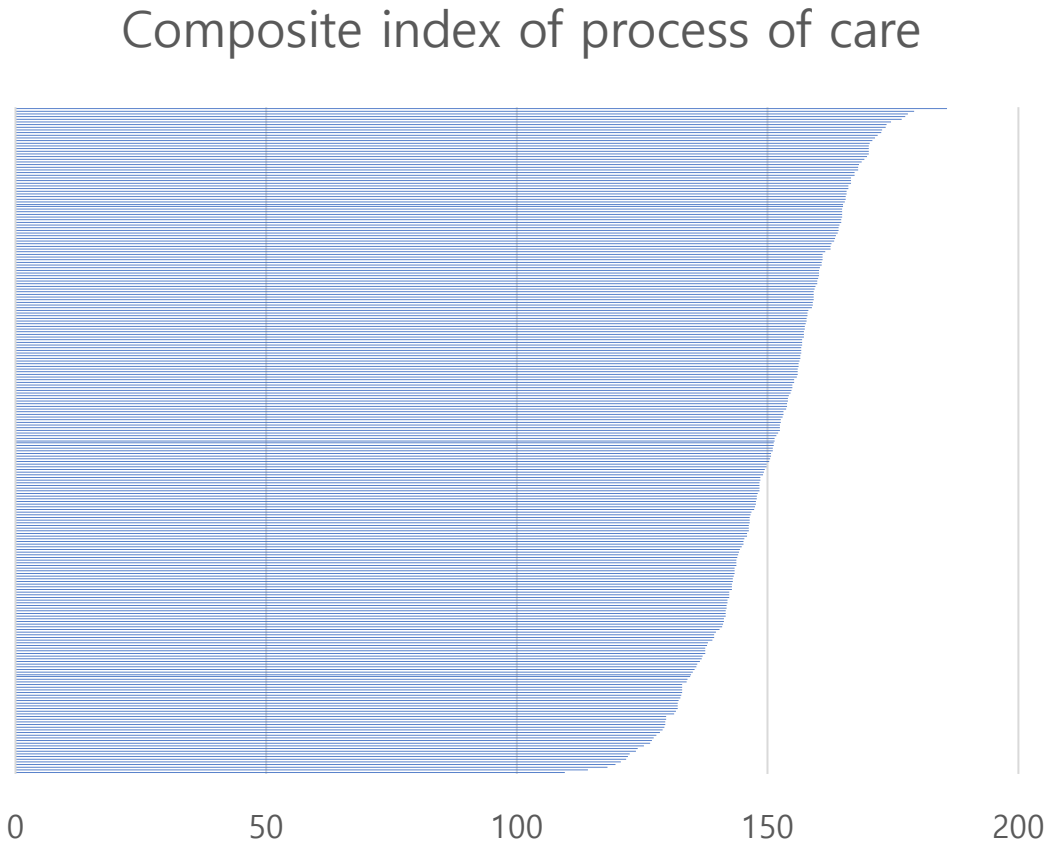
Nephropathy screening



Results – Regional variation(2014)



Results – Composite index



- Lowest: 109.5 Highest: 185.8
- 90percentile/10percentile ratio: 1.26(166.7/131.7)

- High SES and metropolitan area had higher score

Conclusion

- All indicators were far beyond the optimal achievable level
  - Eye examination was less than 10% even in the best areas
- Most indicators were improved in 2014 compare to 2010
  - But did not reach other OECD countries achievement meaning that further improvement is still needed
- Variations between districts exist
  - Eye examination varied most(10 fold)
  - Prescription rates varied least(1.33 fold)

Discussion

- Probable contributors to suboptimal quality of diabetes care in South Korea
  - Lack of goals
    - No national targets and methods to control diabetes
  - Lack of integration
    - No linkage between healthcare service and social service
  - Fragmented delivery system
    - Most healthcare service is provided by specialists and there is no proper deliver system between specialists and between level of care

"Problem of system"

Further research question

- From “Where to look” to “How to change”

- Find what causes lower quality of diabetes care
  - Which factors are related to the quality of diabetes care
  - Individual / provider / clinic or hospital / region

Thank you for your attention!