A patient-centered, population health approach to older adults with CKD

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Background

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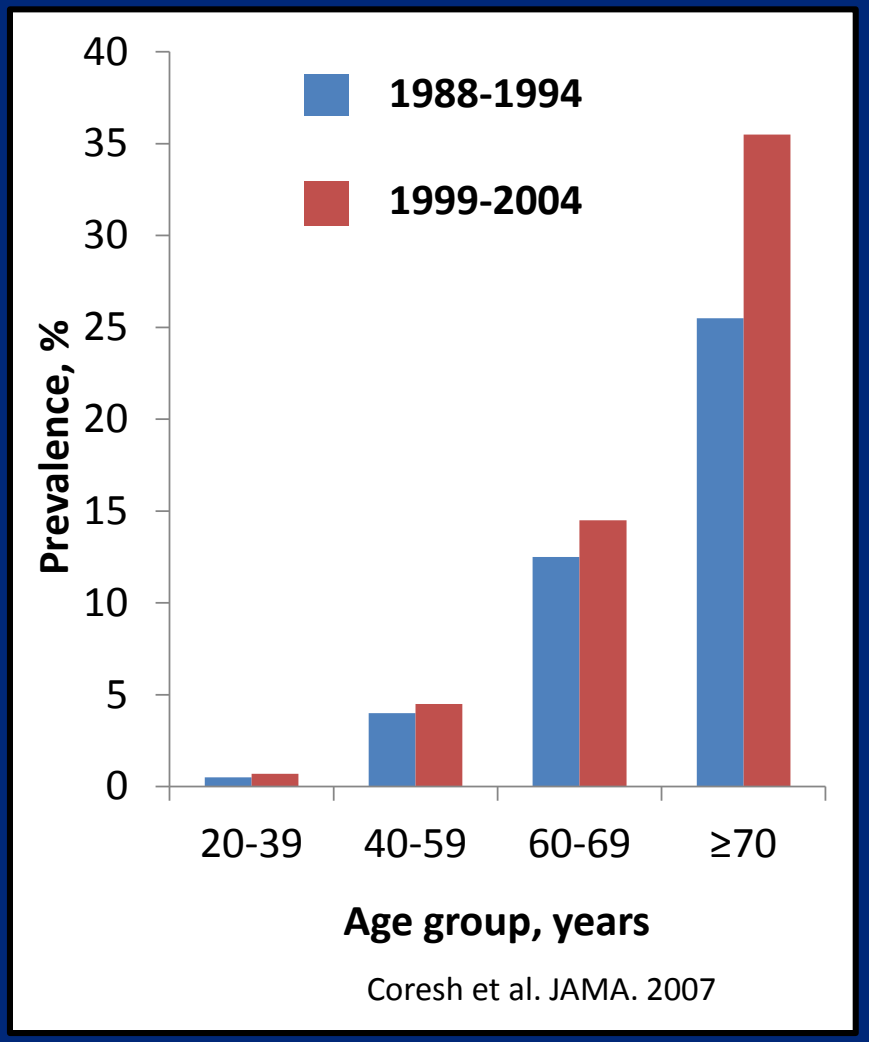
Patient Centered Care...Second to None...One Veteran at a Time

- Chronic kidney disease (CKD) is a complex chronic disease
- Prevalence increasing among older adults
- Associated with adverse health outcomes
- A **population health management** framework for older adults with CKD may be helpful



Coresh et al. JAMA. 2007

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Population health

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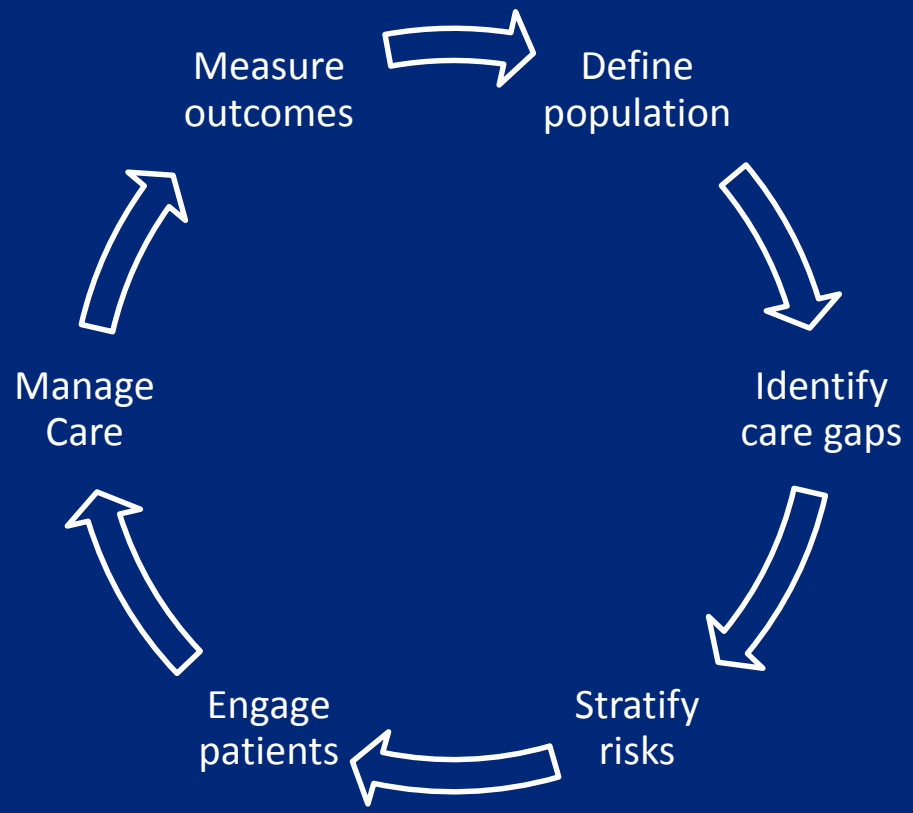
- Population health - the health outcomes of a group of individuals, including the distribution of such outcomes within the group[1]
- Population health management – An approach to improving the health outcomes of a group of individuals
  - Information (data) on group used to improve outcomes of patients within that group[2]
  - Prospective or anticipatory care[3]
  - Patient centered – focus on outcomes that are important to patient and their families

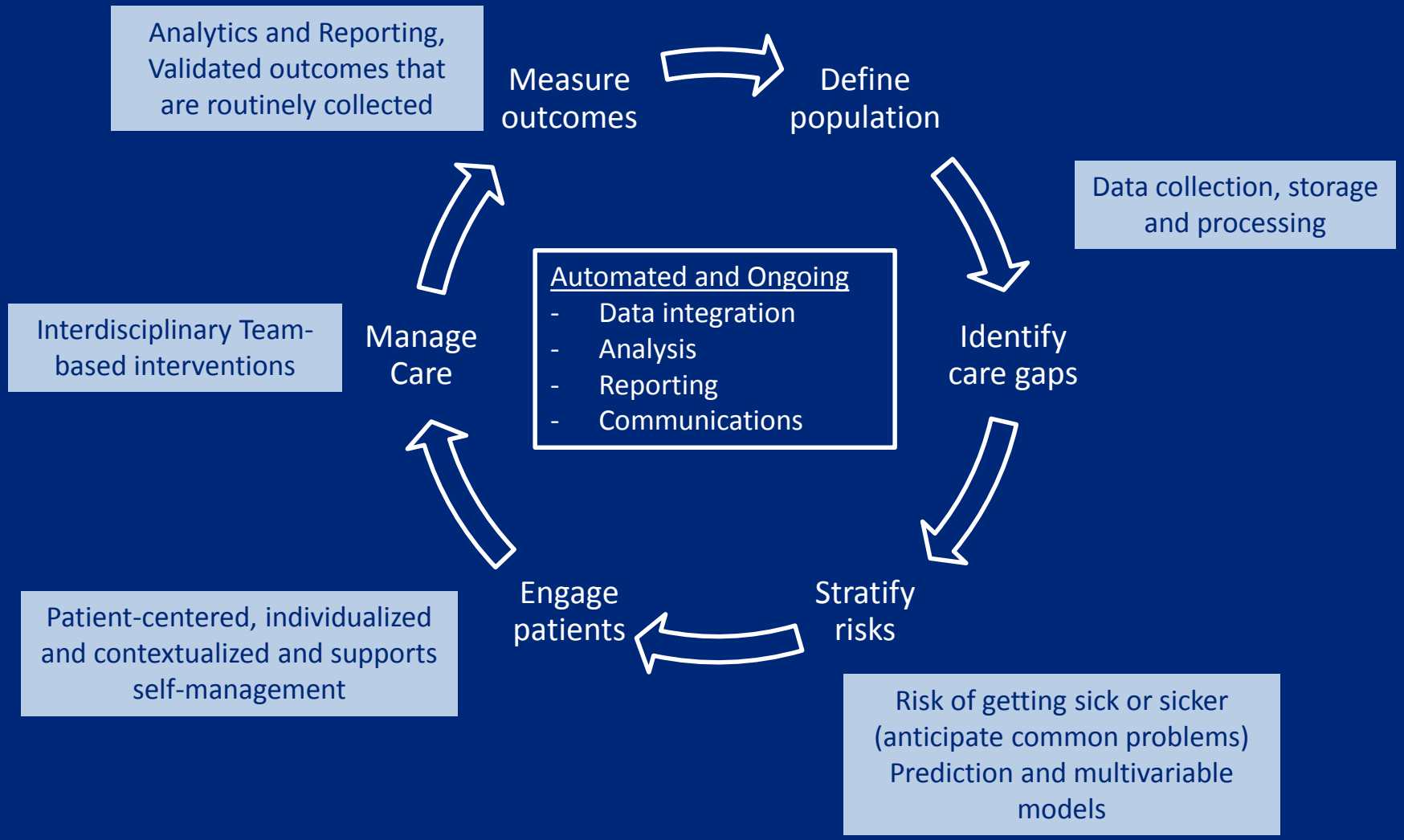
1. Kindig D. Am J Public Health 2003.
2. Margolius. Health Affaris. 2011
3. Cassel. Medicare Matters. Univ Cal Press. 2007

Population Health Management Framework



Adapted from "Population health management: A roadmap for provider-based automation in a new era of health care." Institute for Health Technology Transformation.

Population Health Management Framework



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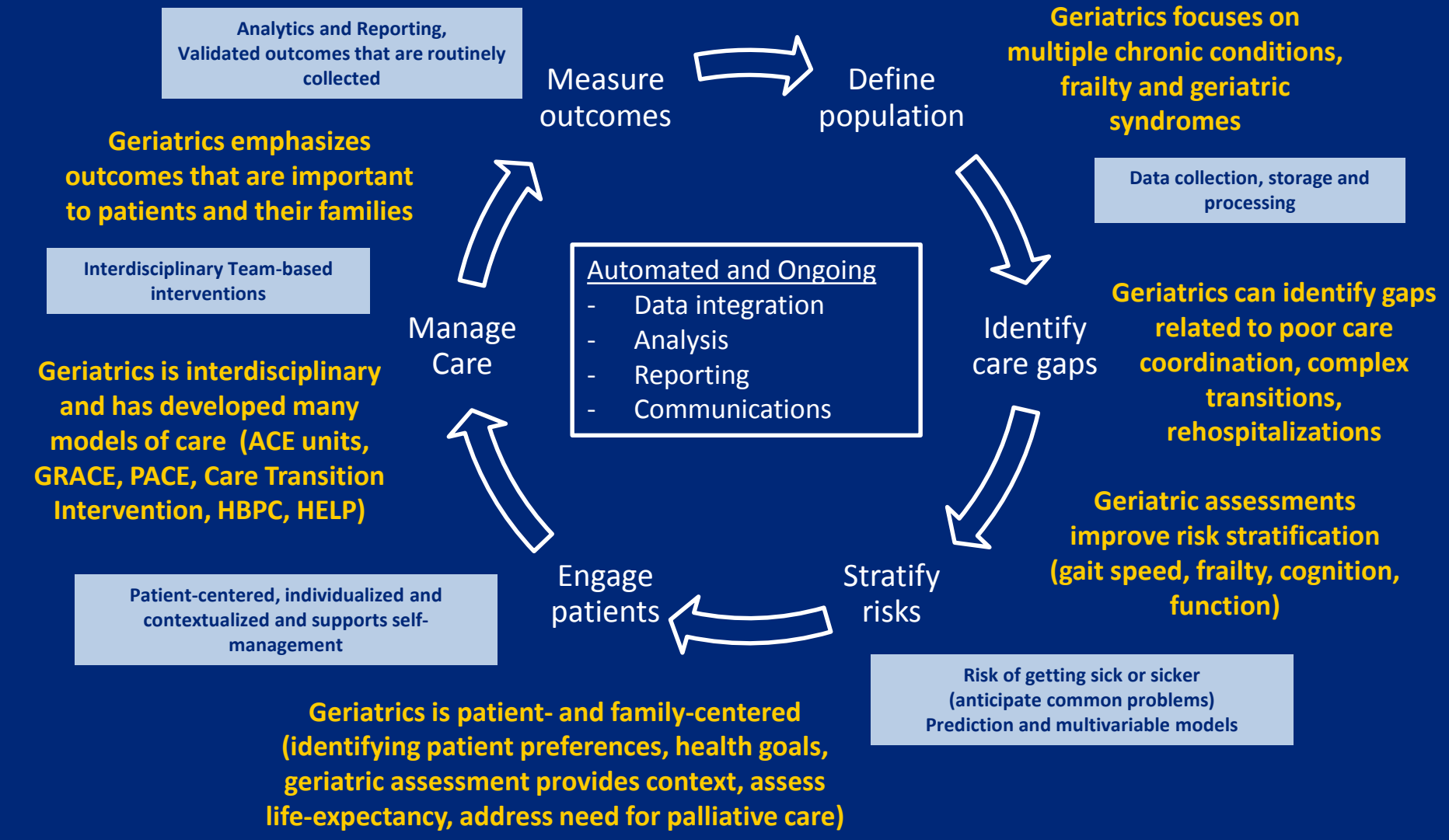
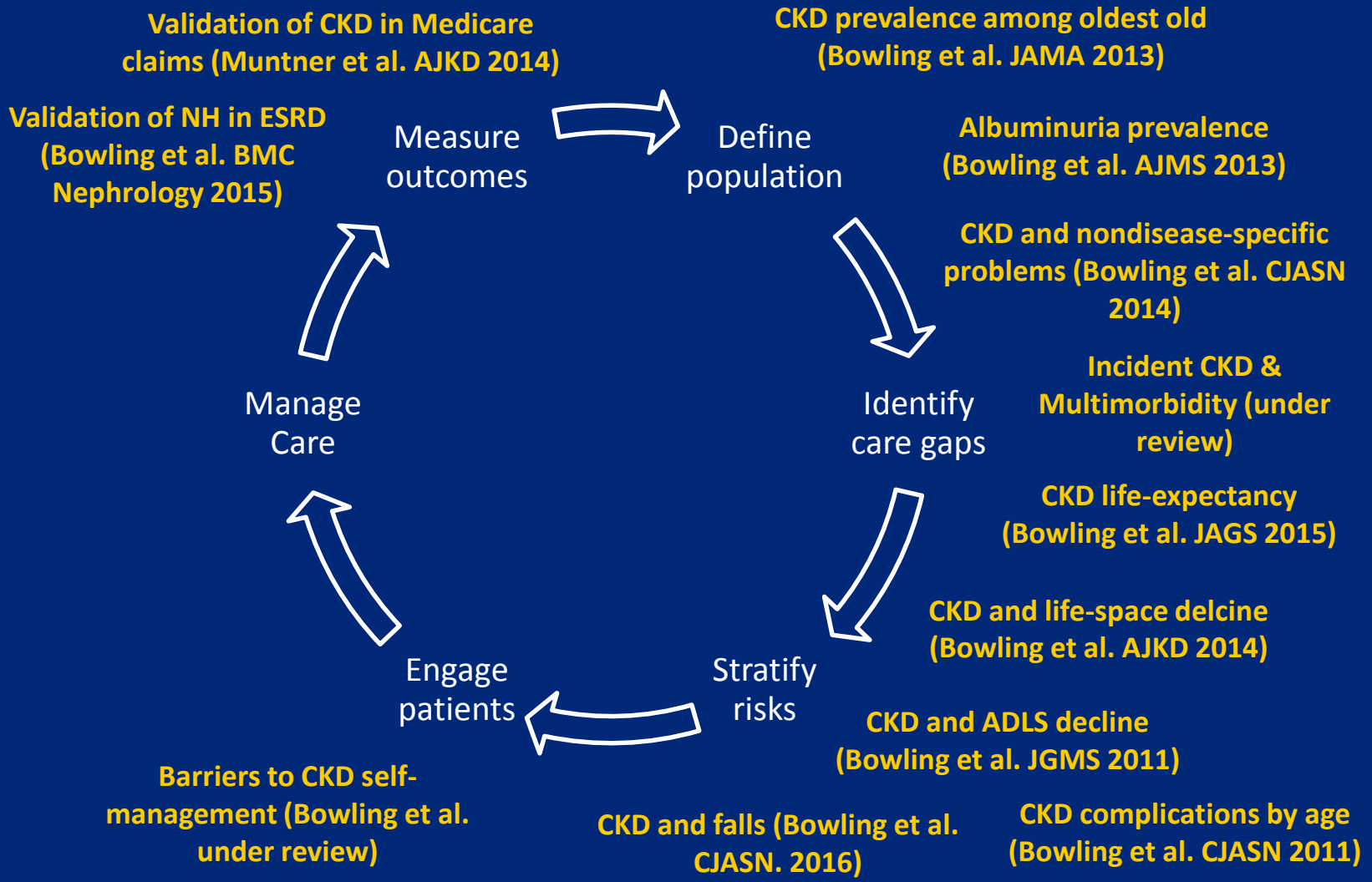
What does this have to do with geriatrics?



Our research program in CKD and population health management



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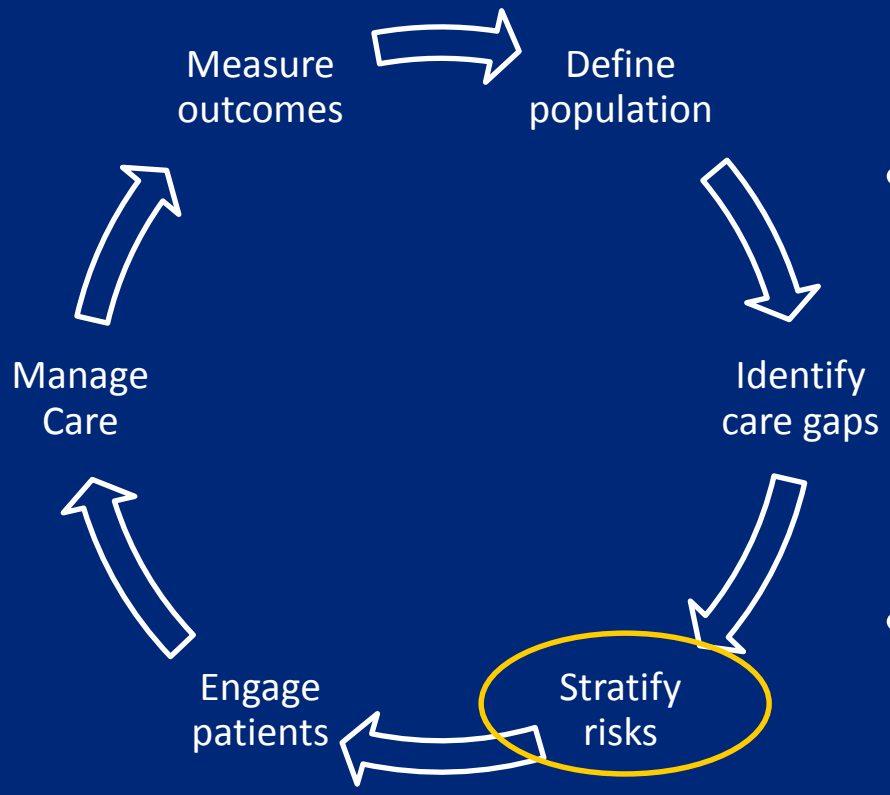
Can geriatric conditions be used to better stratify risks?



- Biomarkers used to stratify risk in CKD
- Geriatric conditions (falls, mobility impairment, cognitive impairment) are strong predictors of adverse health outcomes
- **QUESTION: For VA patients 70 years and older with CKD, can geriatric conditions be used to predict risk for <u>hospitalization and ED visits?</u>**

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Data access

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- VA has a large corporate data warehouse (CDW)
  - 1.5 petabytes of storage
  - 20 million unique patients
  - 1,000 separate data tables
  - 20,000 columns
  - 80 billion rows
- VA Informatics and Computing Infrastructure (VINCI)
- **PROBLEM:** Geriatric conditions not routinely captured in these data or only in text fields

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Clinical reminder in the VA Renal Clinic

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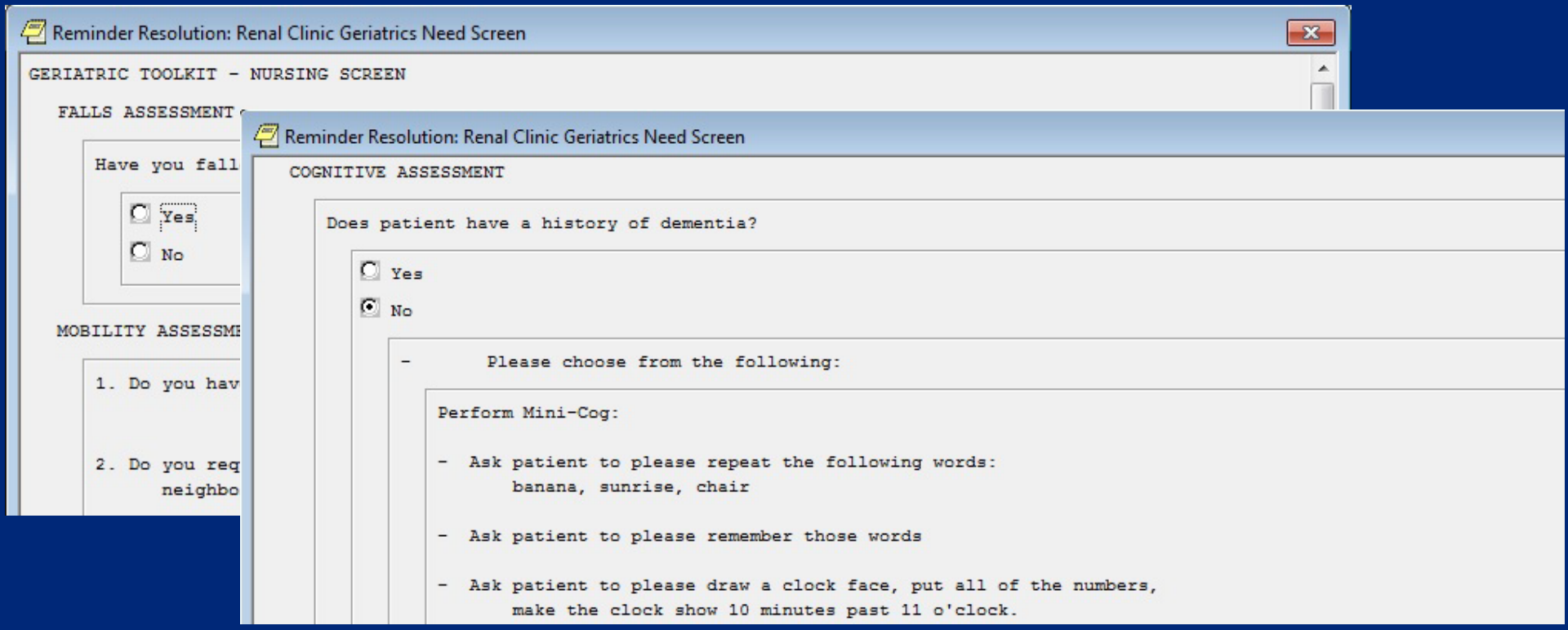
- Unstructured data in clinical notes → structured data variables in CDW



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Data processing

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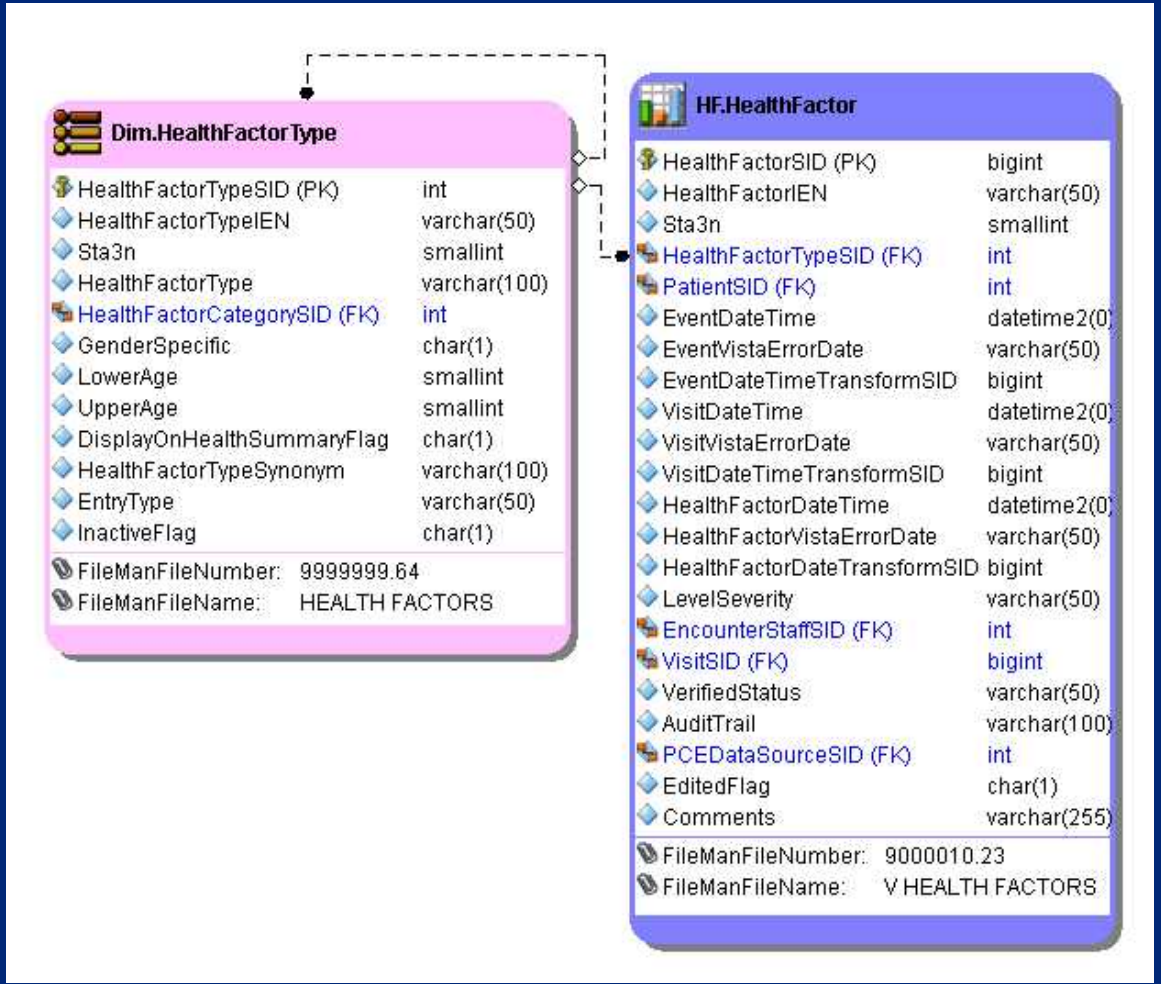
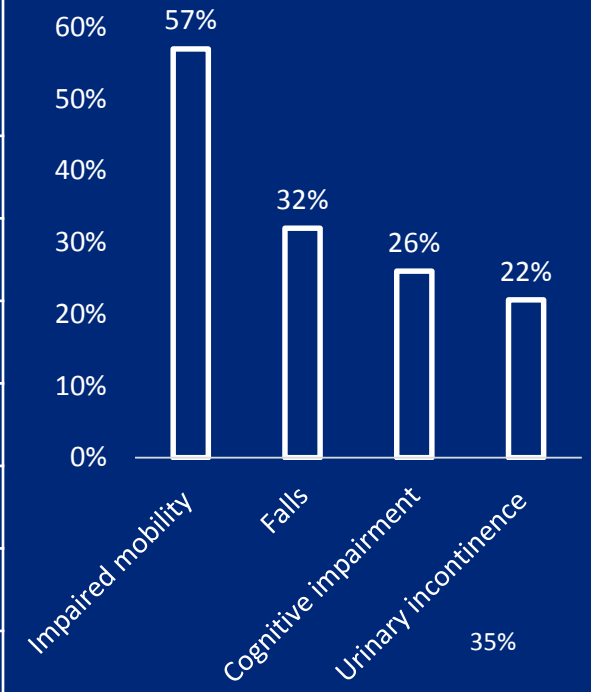
- Microsoft SQL Server Management Studio 2014
- SAS Enterprise Guide 6.1
- R x64 3.1.2



VA Renal Clinic patients ≥ 70 years old (n= 201)

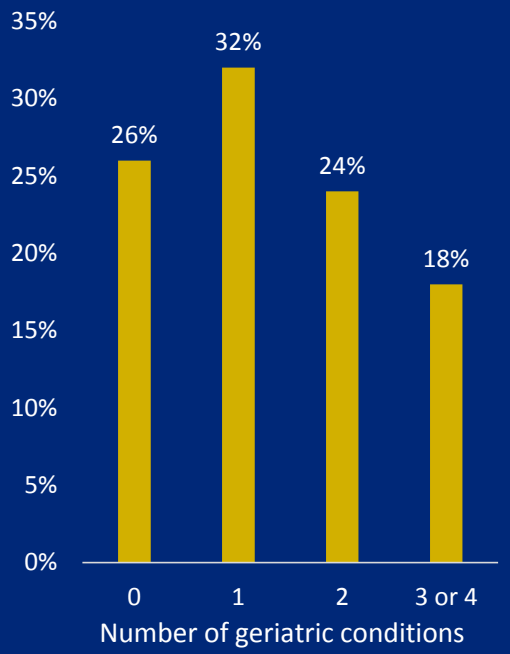
Characteristics	% or median (range)
Age	76 (70 – 95)
Male	99%
African American	46%
Hypertension	98%
Diabetes	64%
Heart failure	30%
eGFR (ml/min/1.73 m^2)	
≥ 60	3%
45 – 59	24%
30 – 44	41%
< 30	32%
ACR, mg/g	
< 30	40%
30 – 299	38%
≥ 300	22%

eGFR = estimated glomerular filtration rate, ACR = albumin-to-creatinine ratio



Unrecognized geriatric conditions are common

42% of patients have 2 or more geriatric conditions



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Stratify risks

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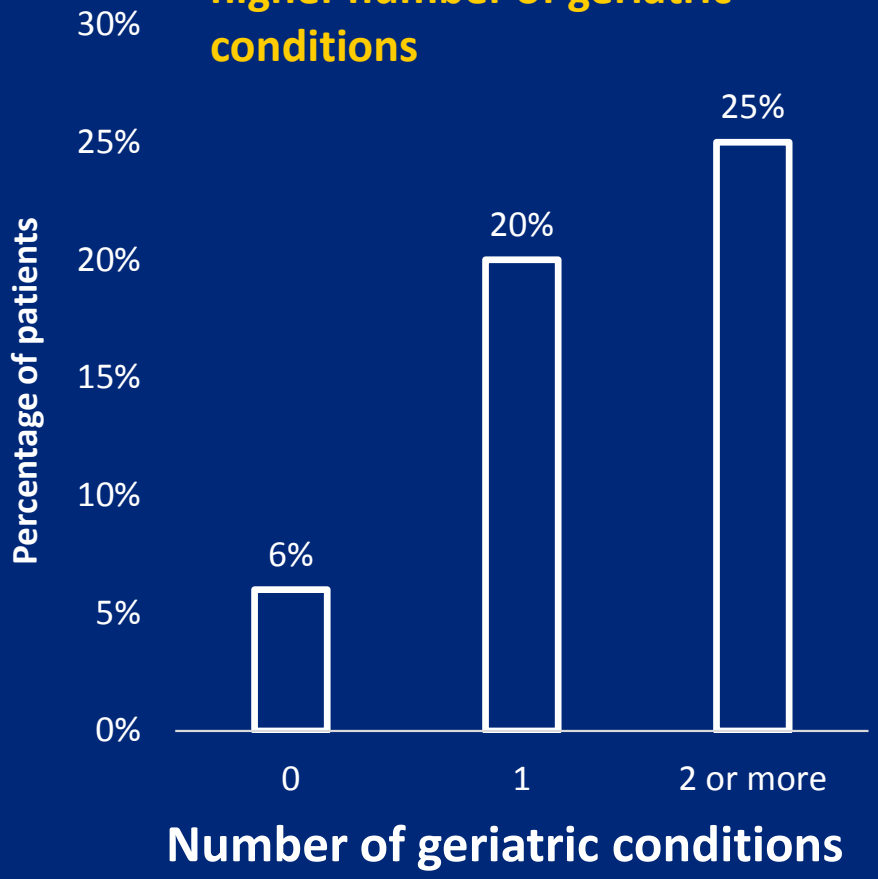
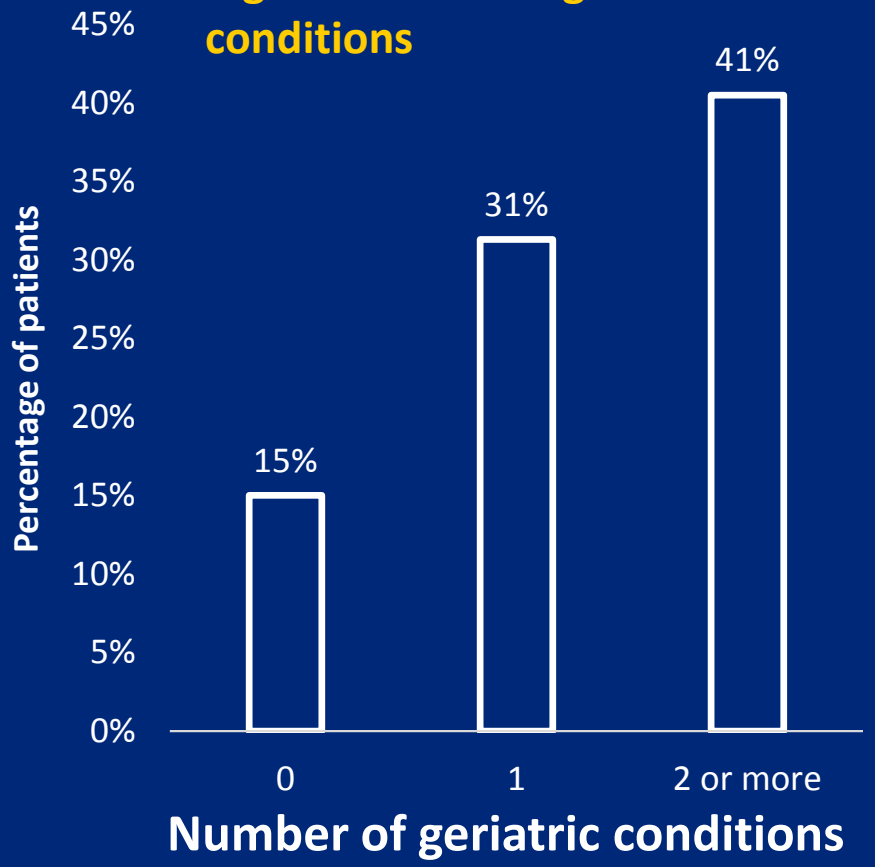
Higher hospitalization at higher number of geriatric conditions



Higher ED utilization at higher number of geriatric conditions



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Stratify risks

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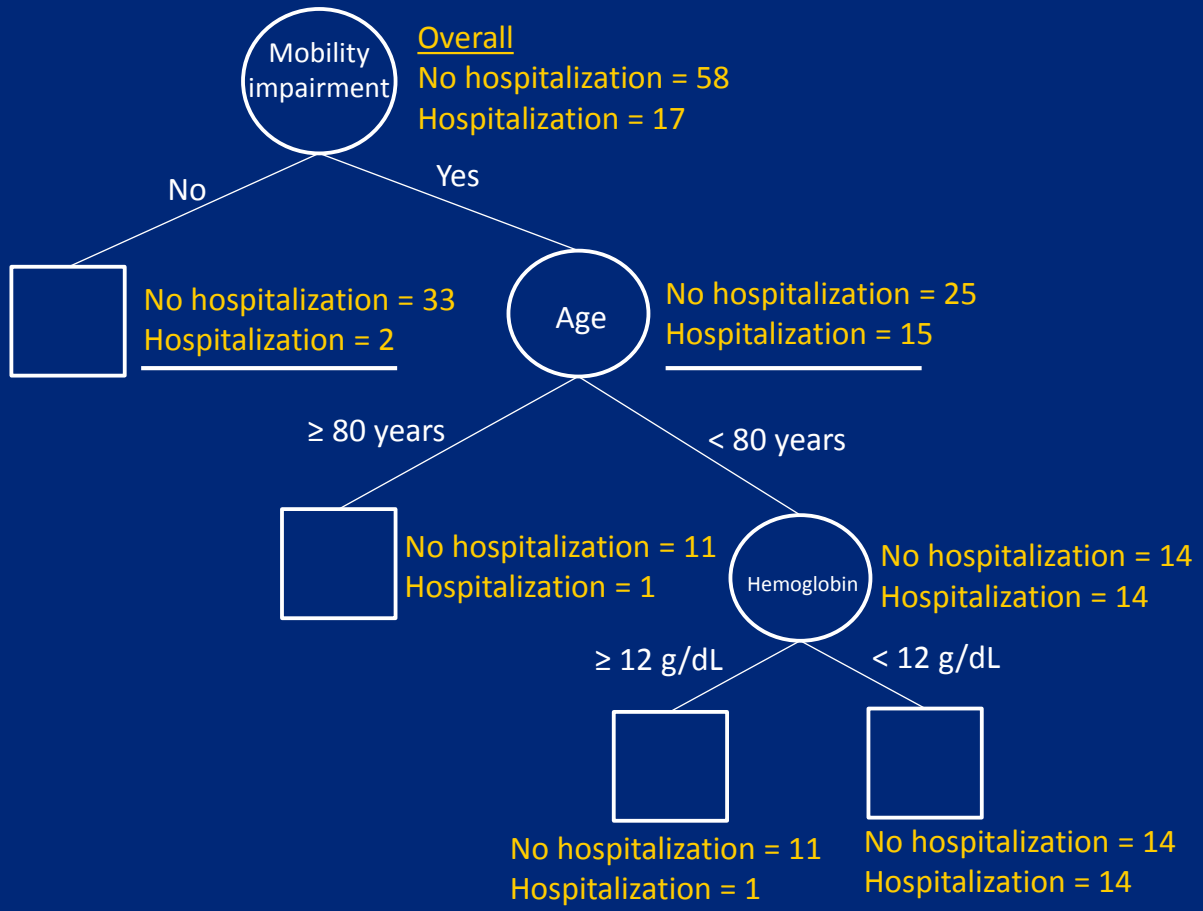
Classification and regression tree (CART) approach



- Split sample approach
- Training sample – 17 hospitalizations
- Mobility impairment most important characteristic for stratifying risk for hospitalization
- Validation sample low misclassification rate = 0.16

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Conclusions

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- Population health framework helpful for conceptualizing research and clinical programs for older adults with CKD
- Access to geriatric assessments may improve risk stratification in this population
- Next steps include engaging patients and managing care