

How Prepared is the U.S. Health Care System for a Future Alzheimer's Treatment?

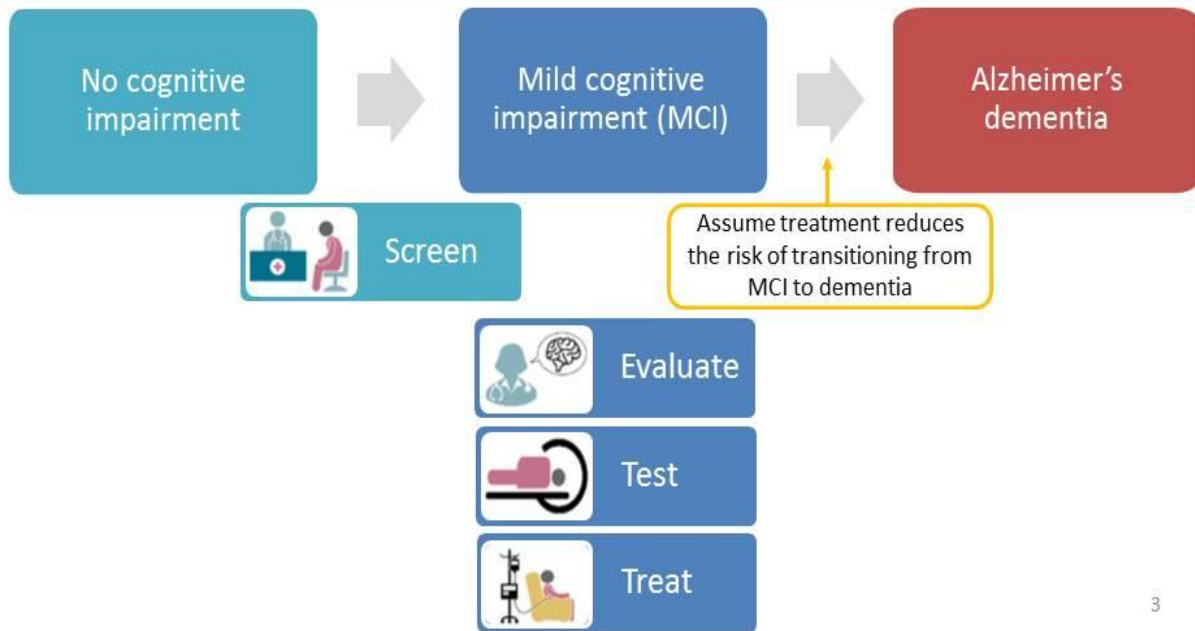
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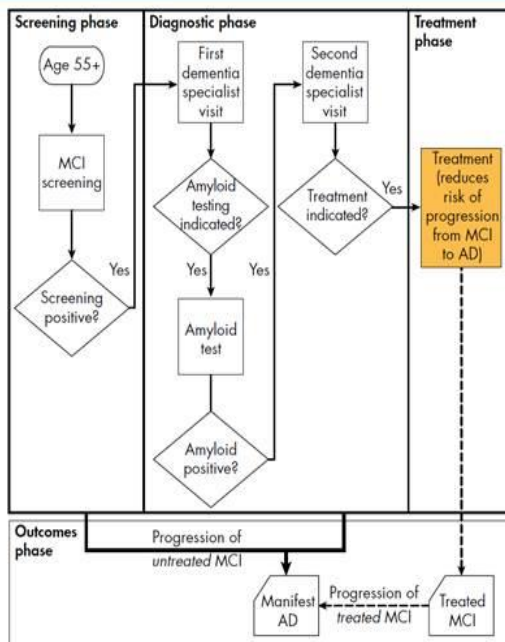
Why focus on Alzheimer's treatment now?

- Alzheimer's dementia affects over 5 million Americans today
- Guarded optimism for Alzheimer's disease-modifying therapies in development
- Treatment paradigm has shifted to early stage disease
 - Estimated 13.8 million Americans with mild cognitive impairment
- Objective: Quantify the potential mismatch between supply and demand for the delivery of a future Alzheimer's treatment

Alzheimer's disease progression and clinical pathway



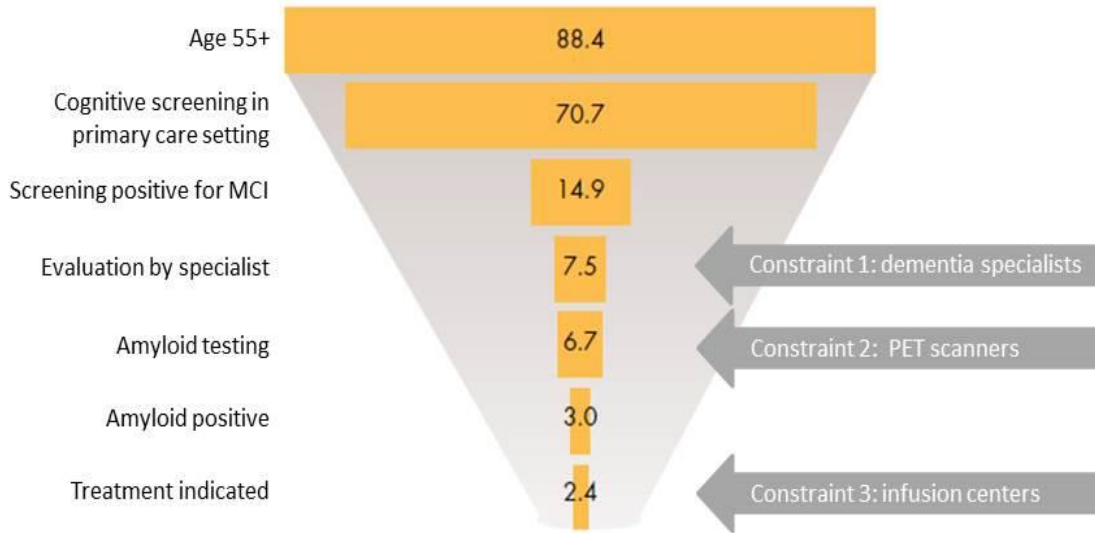
Model assumptions and framework



Key assumptions:

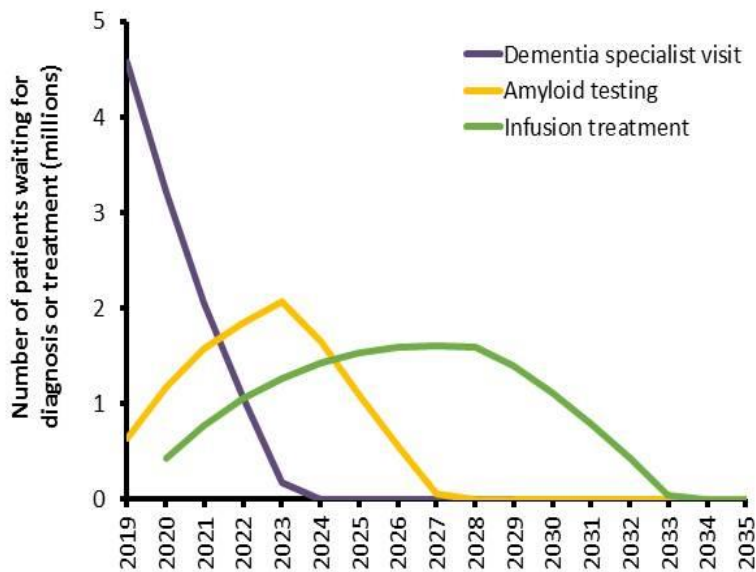
- Disease-modifying therapy for early-stage Alzheimer's disease available in 2020
- Therapy delivered by intravenous infusion every 4 weeks for a year
- Treatment reduces relative risk of progression from MCI to Alzheimer's dementia by 50%
- Dementia specialists: neurologists, geriatricians, geriatric psychiatrists
- Uptake rates based on expert input

Snapshot of potential patients in 2019 (millions)



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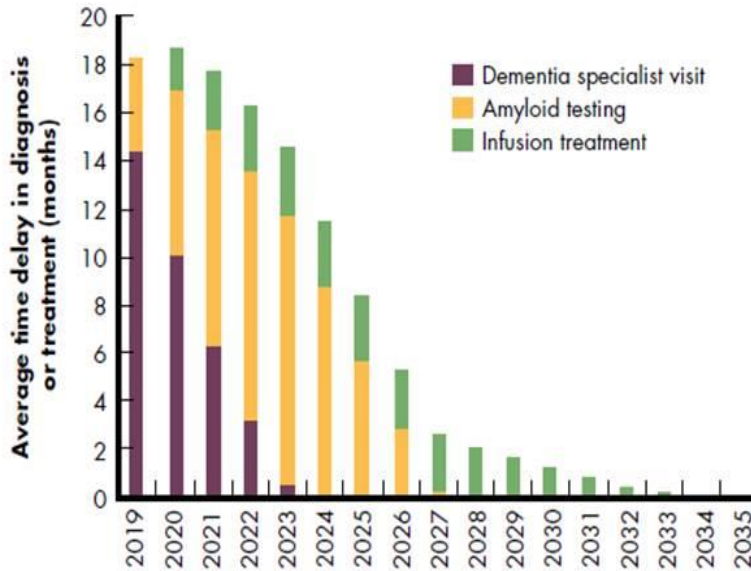
Millions of patients projected to be on waitlists



- Initial bottleneck for specialist visits with 4.6 million patients
- With treatment first available in 2020, wait lists expected until 2034

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Projected wait times are extensive



- Average 14-month wait for specialists in 2019
- Average 11-month wait for testing in 2023
- Infusion waits until 2034



- 2.1 million MCI cases could progress to Alzheimer's dementia while on wait lists

Specialist shortage is most urgent issue



- Binding constraint and unlikely to resolve
- Improve productivity
 - More specific secondary screening test for MCI reduce number of false positives or to prioritize based on risk
 - Task shifting during evaluation process
- Qualifying providers from other specialties
 - Train physicians in larger specialties (internal medicine, general psychiatry) and potentially mid-level providers in dementia care
 - Use telemedicine to facilitate access to dementia care specialists by primary care providers

Range of diagnostic options could be expanded



- Expanding capacity for PET scans technically feasible but probably inefficient
 - High fixed and variable cost
 - Insufficient volume for cyclotrons in rural areas
 - Building up capacity to handle prevalent cases when treatment is first approved would lead to idle capacity later
- Use of CSF assay is a possible solution
 - Samples can be obtained in most clinics and sent to central labs
 - Less expensive per test
- Blood and retinal tests in development

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Access to amyloid PET limited by geographic gaps in cyclotrons that manufacture tracers



SOURCE: Society of Nuclear Medicine and Molecular Imaging as of October 6, 2017 (undated); Cardinal Health (2017).
RAND RR2272-3

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Home infusions could play an important role



- Expected prevalent cases imply the need to triple existing infusion chair capacity
 - Increase would likely lead to idle capacity later
- Home infusion delivery could increase capacity in the short run without fixed infrastructure
 - Covered for patients in traditional Medicare starting 2020
 - Already covered by many Medicare Advantage plans
- Nature of treatment could allow home infusion
 - Short duration, cognitively intact patients, rare acute reactions

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What are the implications for a research agenda?

- Development of better screening tools to reduce the large number of patients entering care pathway probably has high ROI
 - “rescoring” of MMSE
 - Better tests for primary or secondary screening or risk stratification
 - Non-invasive biomarkers
- Demonstration projects for *scalable* delivery models that leverage specialist time better are needed
 - Will also help to address regional access issues
- Capacity constraints on diagnostic testing and infusion delivery are likely to be addressed with current efforts
 - Assuming adequate reimbursement

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Summary

- Disease-modifying AD therapy would be a breakthrough
- Simulation suggests that US healthcare system is ill-prepared to deliver a therapy to the large number of prevalent cases
 - As many as 2.1 million patients might develop AD because of delays in access to care under current capacity assumptions
- Increasing capacity to deliver a potential therapy would involve payment policy, regulatory requirements, workforce considerations, and capacity planning

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Thank you

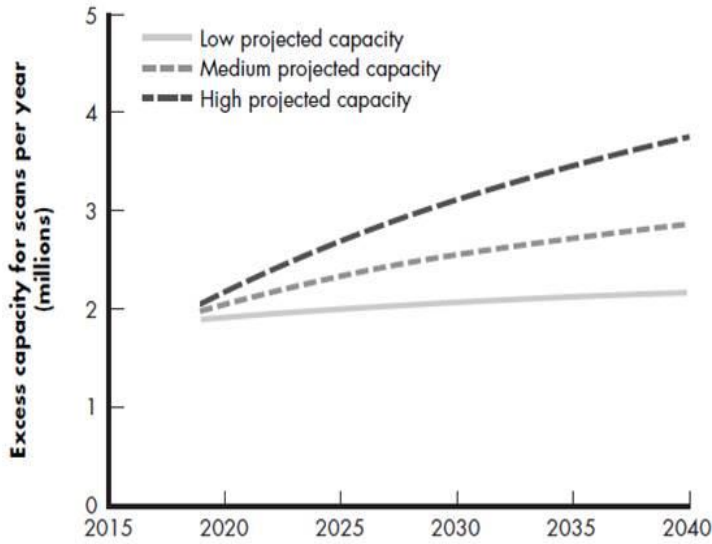
Report: www.rand.org/t/RR2272

Funding: Biogen



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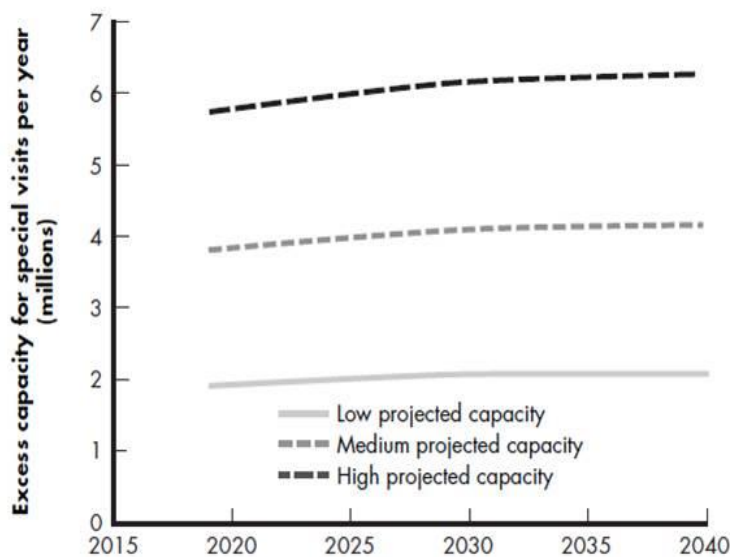
PET scan capacity



Versus demand for 6.7 million scans in 2019 (plus geographic gaps)

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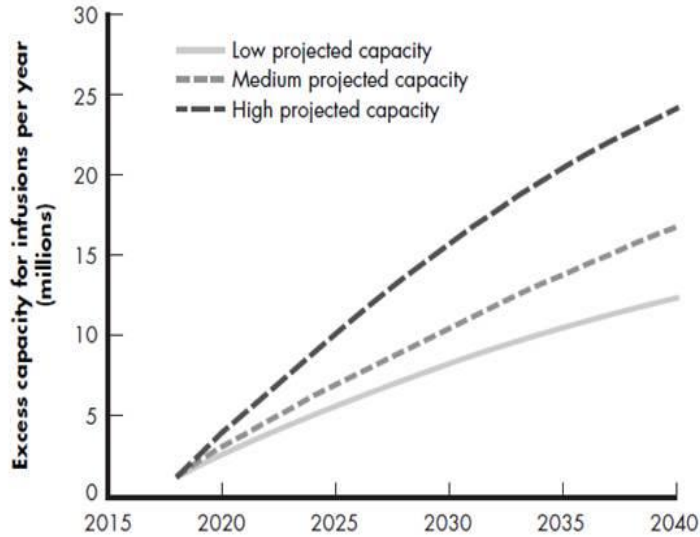
Dementia specialist workforce capacity



Versus demand for 7.5 million evaluation visits and 3 million indication visits in 2019

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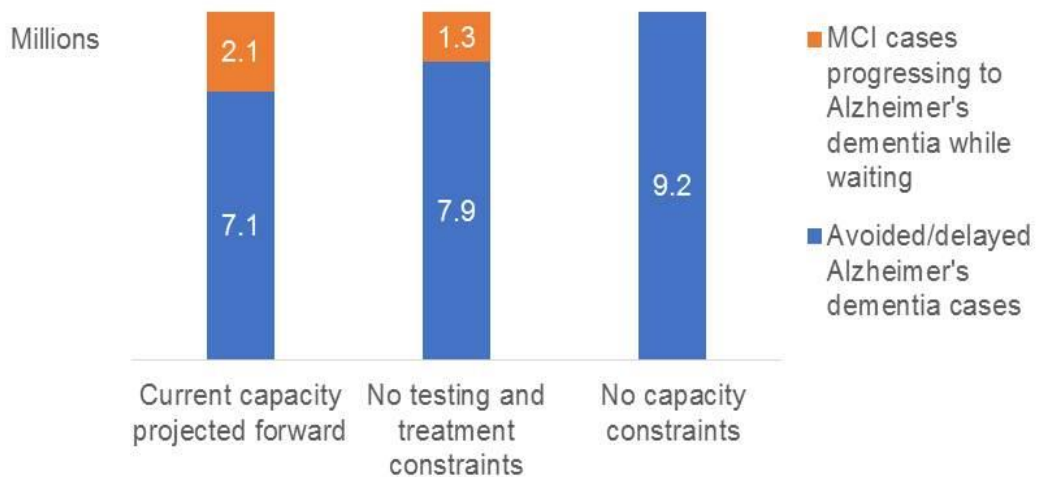
Infusion capacity



Versus demand for 33 million infusions in 2020

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MCI progresses to dementia while patients wait, 2020-2040



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