MODELING THE IMPACT OF ASYMPTOMATIC TESTING STRATEGIES IN SCHOOLS

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UC San Diego Return to Learn: Three Pillars

Risk Mitigation	Viral Detection	Intervention
Cleaning and sanitation	Symptomatic testing	Case isolation
Face coverings	Asymptomatic testing	Contact tracing
Physical distancing	Environmental monitoring	Exposure notification
Structural reconfiguration	County surveillance	Molecular sequencing

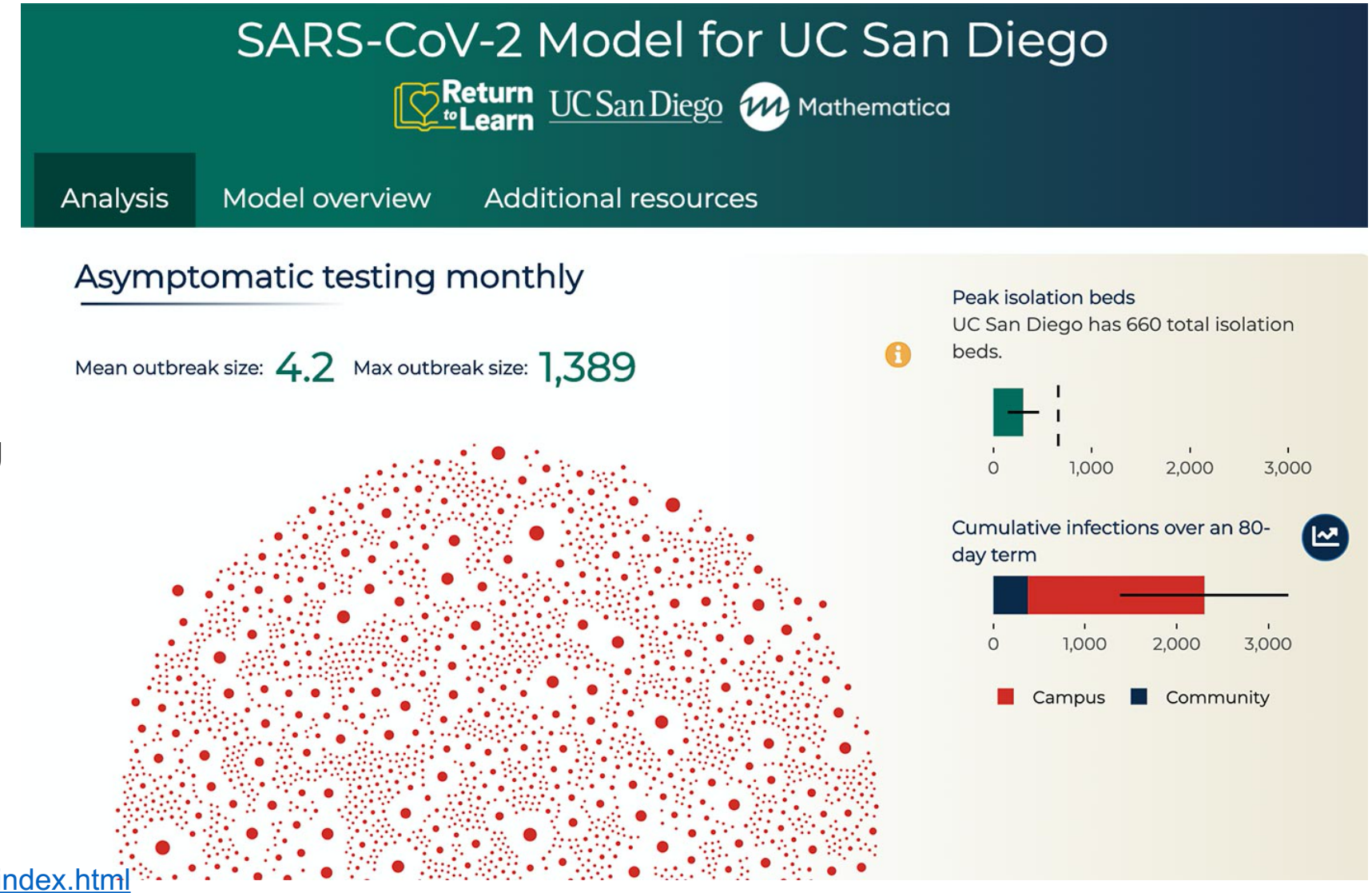
Interdependent and Adaptive

MATHEMATICAL MODELING INFORMING RETURN TO LEARN

Useful in examining ***relative*** **impact** of different policies:

- Campus **housing** de-densification
- **Classroom** maximum capacity caps and hybrid instruction
- Asymptomatic **testing**
- **Masking** and physical distancing
- Isolation, **contact tracing** and quarantine

Iterative & adaptive



https://college.covid19.mathematica.org
https://returntolearn.ucsd.edu/about/modeling/index.html

MODELING K-12 SCHOOL TESTING STRATEGIES

What is the benefit of entry and periodic ongoing asymptomatic testing for staff and students on SARS-CoV-2 transmission and outbreak detection?

FINDING & TESTING CARRIERS: PRE/A-SYMPTOMATIC

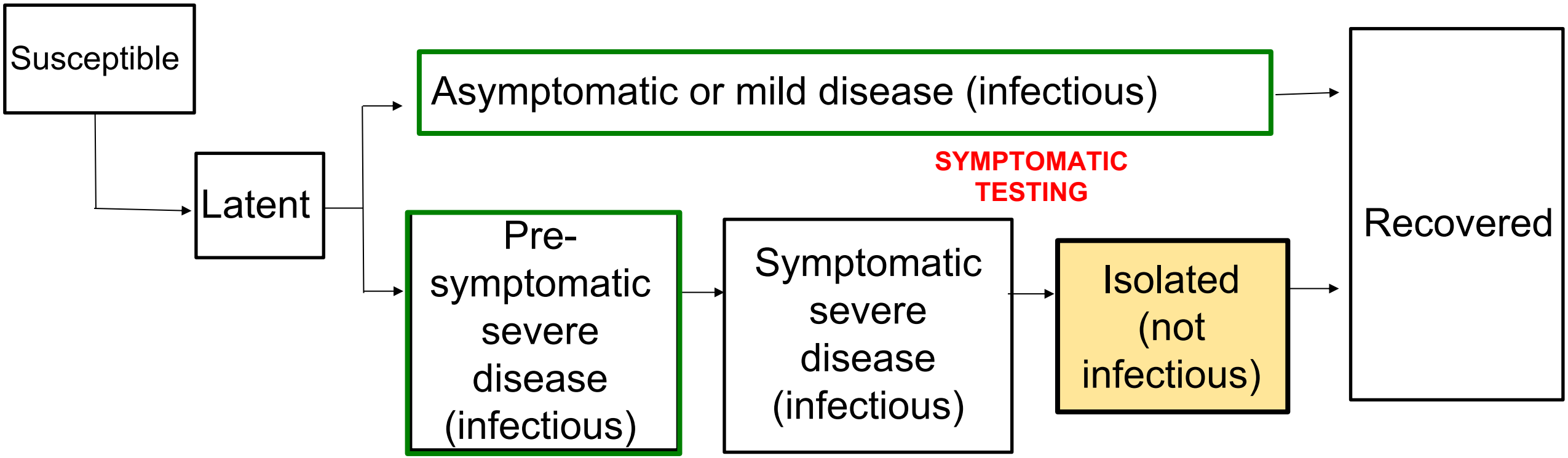
Carriers

Many individuals **do not know they are carriers** because they have not yet shown symptoms *(or never will).*

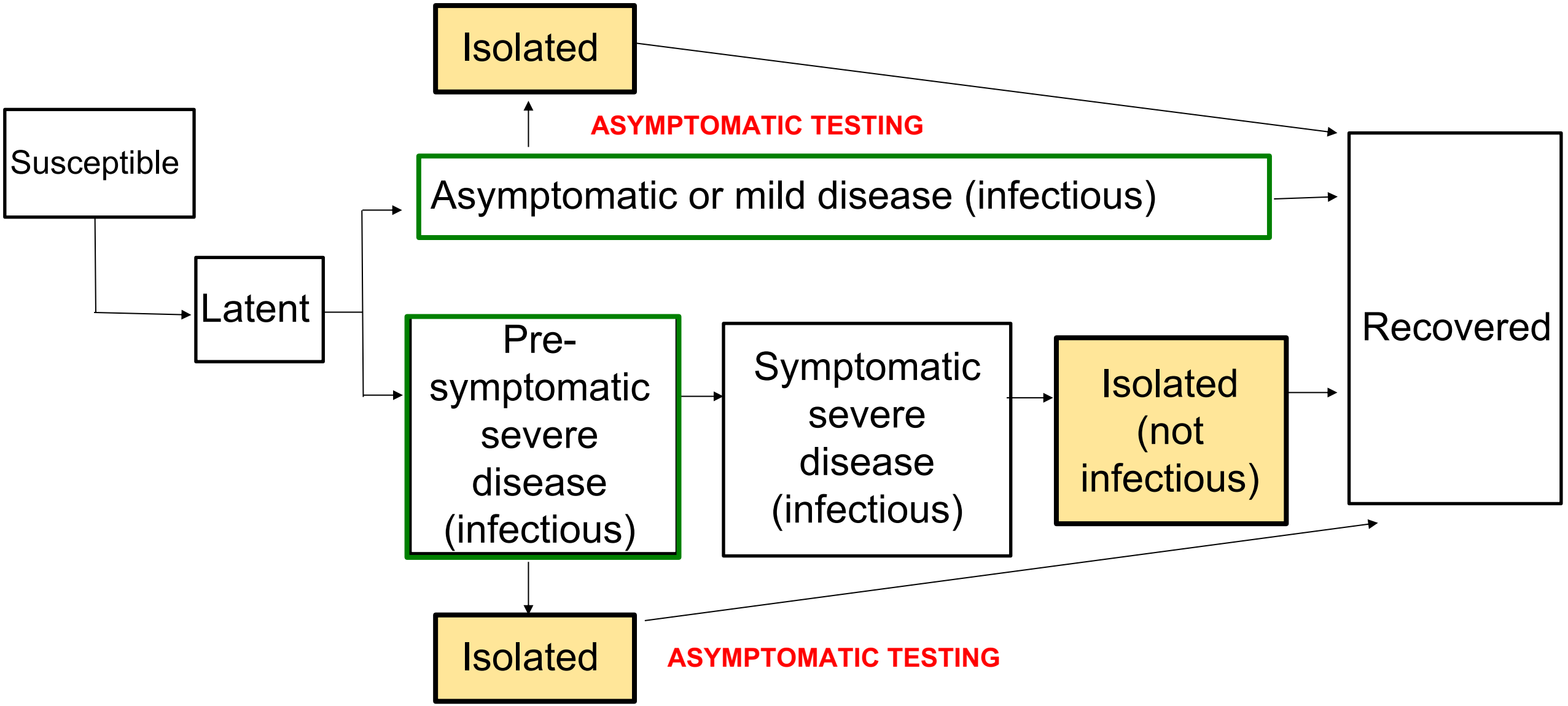
Return

As they resume their daily routines, the virus will spread at even higher levels *(as it is across Europe)*

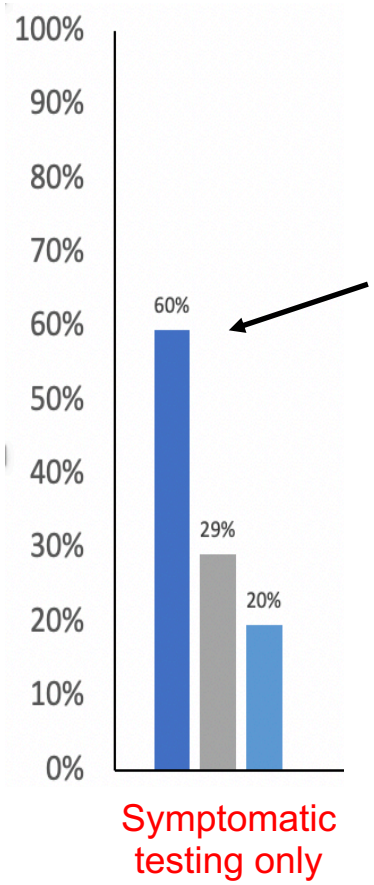
SARS-COV-2 TRANSMISSION MODEL



SARS-COV-2 TRANSMISSION MODEL



WHAT % OF INFECTIONS CAN BE PREVENTED WITH ENTRY & SYMPTOMATIC TESTING?



More infections prevented if transmission rate low (masking, social distancing, etc)

R0=1.5 R0=2 R0=3

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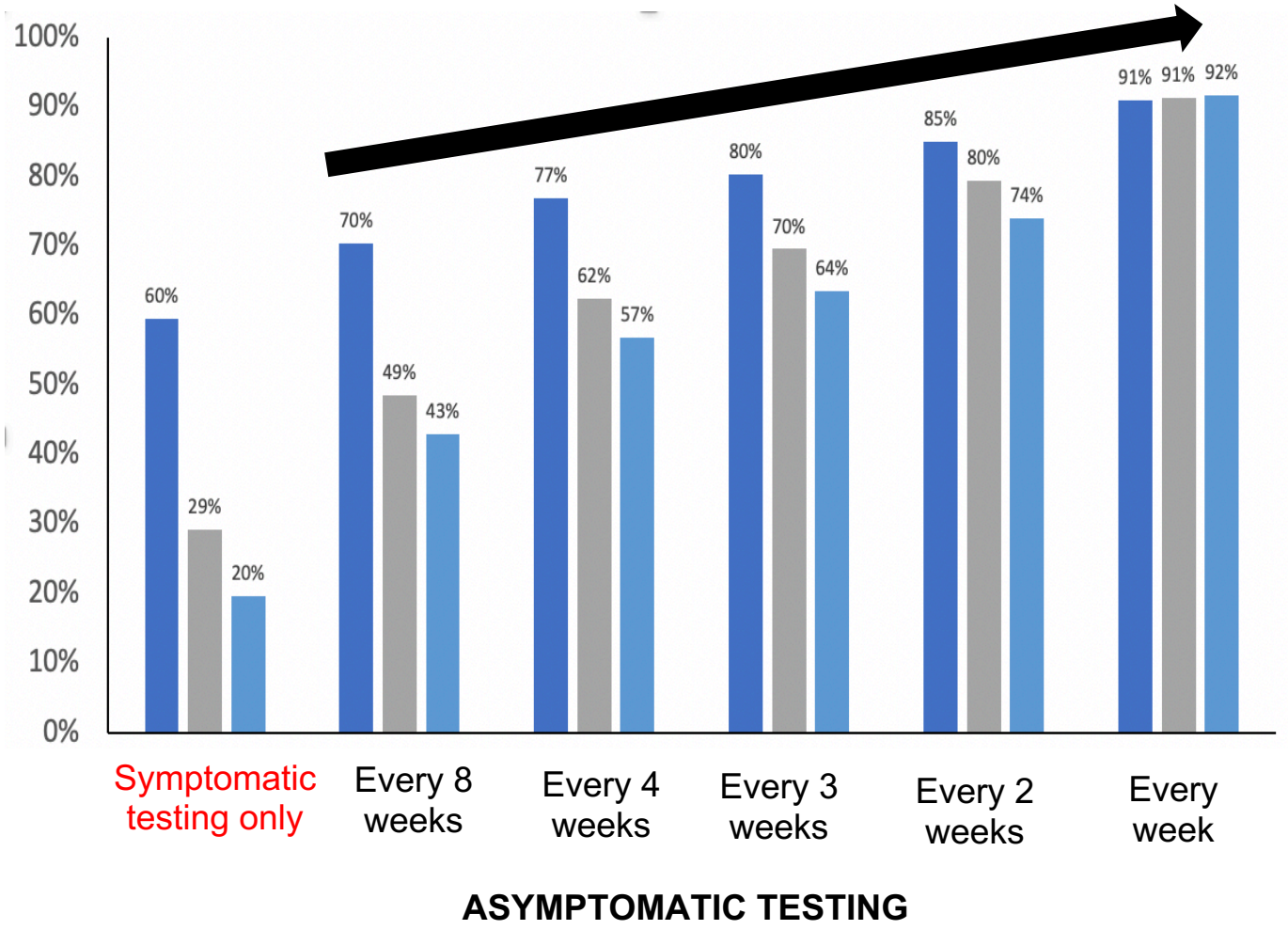
WHAT % OF INFECTIONS CAN BE PREVENTED WITH ENTRY & PERIODIC **ASYMPTOMATIC** TESTING?



More infections prevented with asymptomatic testing

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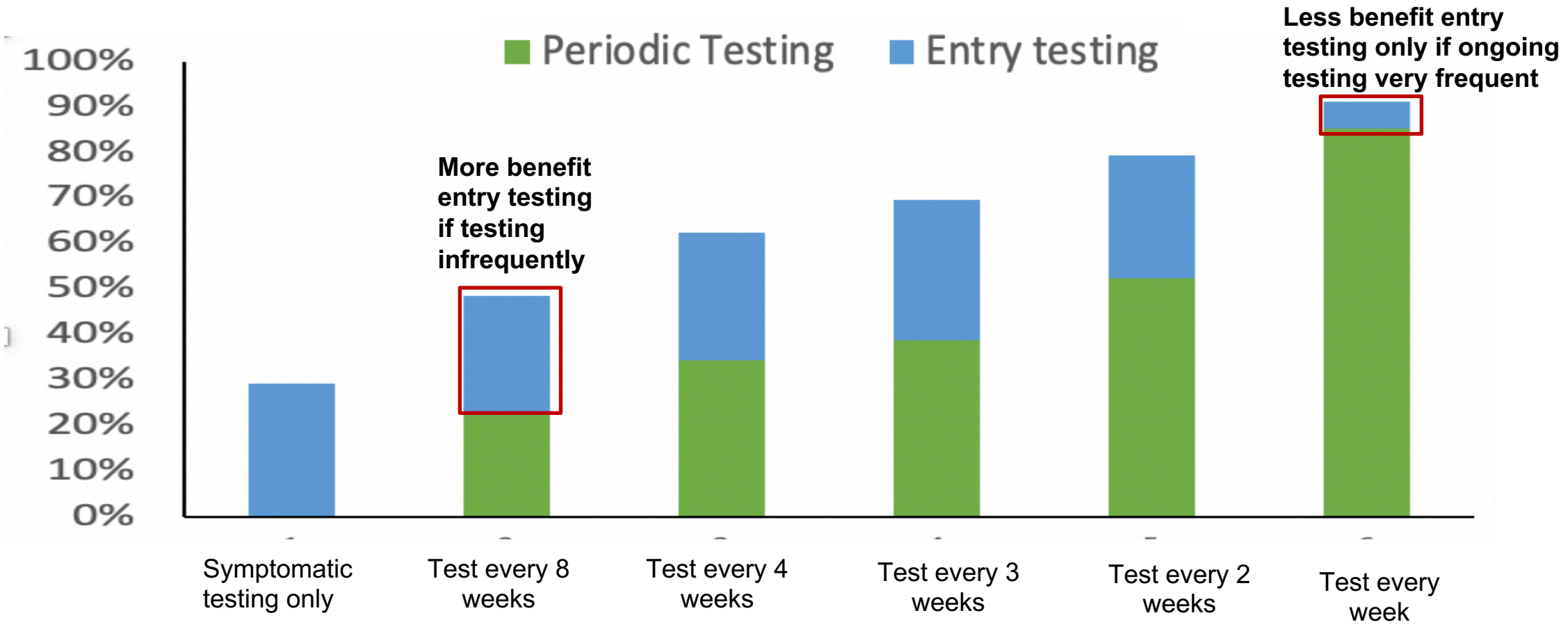
RELATIVE BENEFIT OF ENTRY VS ASYMPTOMATIC TESTING



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NUMBER OF LINKED CASES AT OUTBREAK DETECTION

	Number linked cases when >90% probability of detecting the outbreak from a viral introduction
Only symptomatic testing	8-15
Every 8 weeks	6-11
Every 4 weeks	5-9
Every 2 weeks	4-7
Every week	3-4

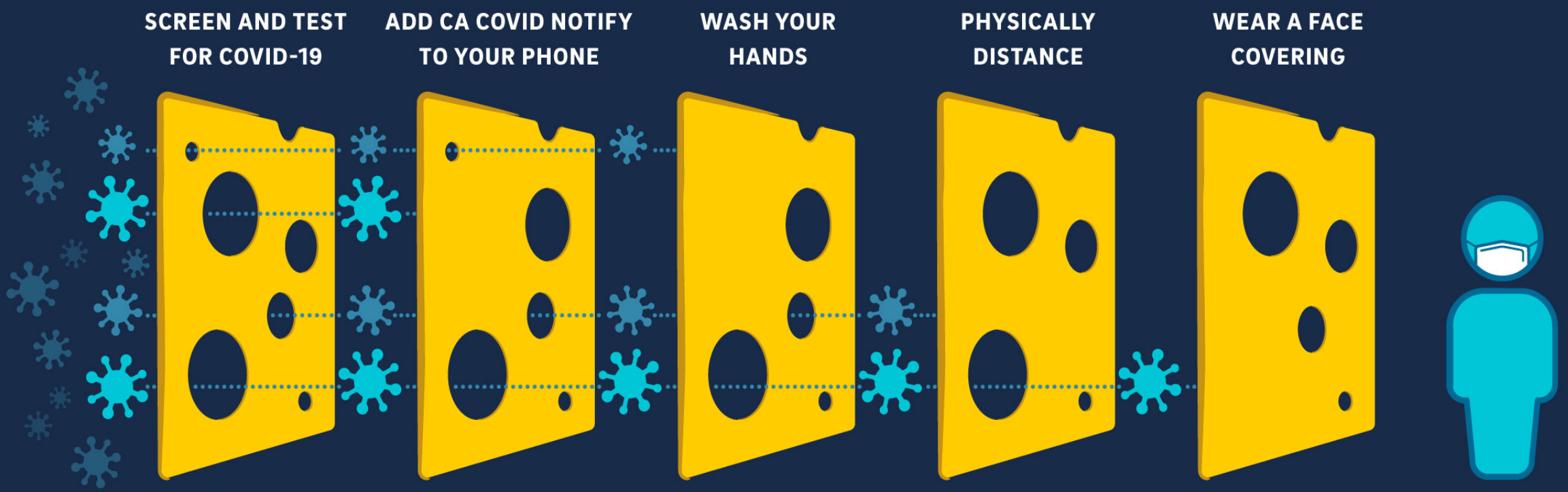
- More testing, fewer cases at outbreak detection for each viral introduction
- Testing every 2 weeks required to detect outbreak when 7 or fewer linked infections

Martin NK, DeGruttola V, and Schooley RT (submitted)

*Range with R0 1.5-3, assuming 80% test sensitivity

Swiss Cheese Model

You can reduce your COVID-19 risk with multiple layers of defense.



Return to Learn