


System Complexity and the Challenge of Too Much Medicine

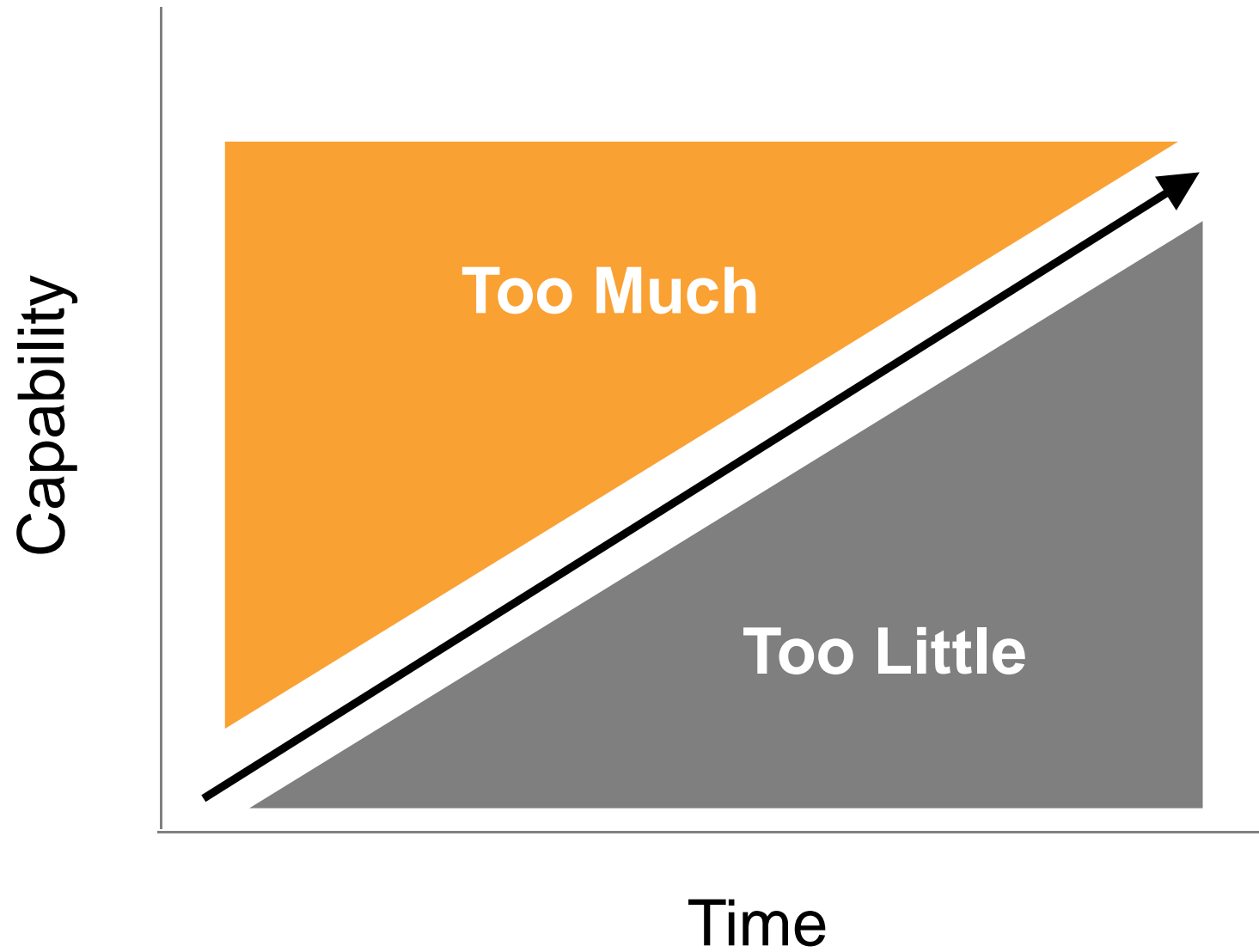
Neel Shah, MD, MPP

 @neel_shah

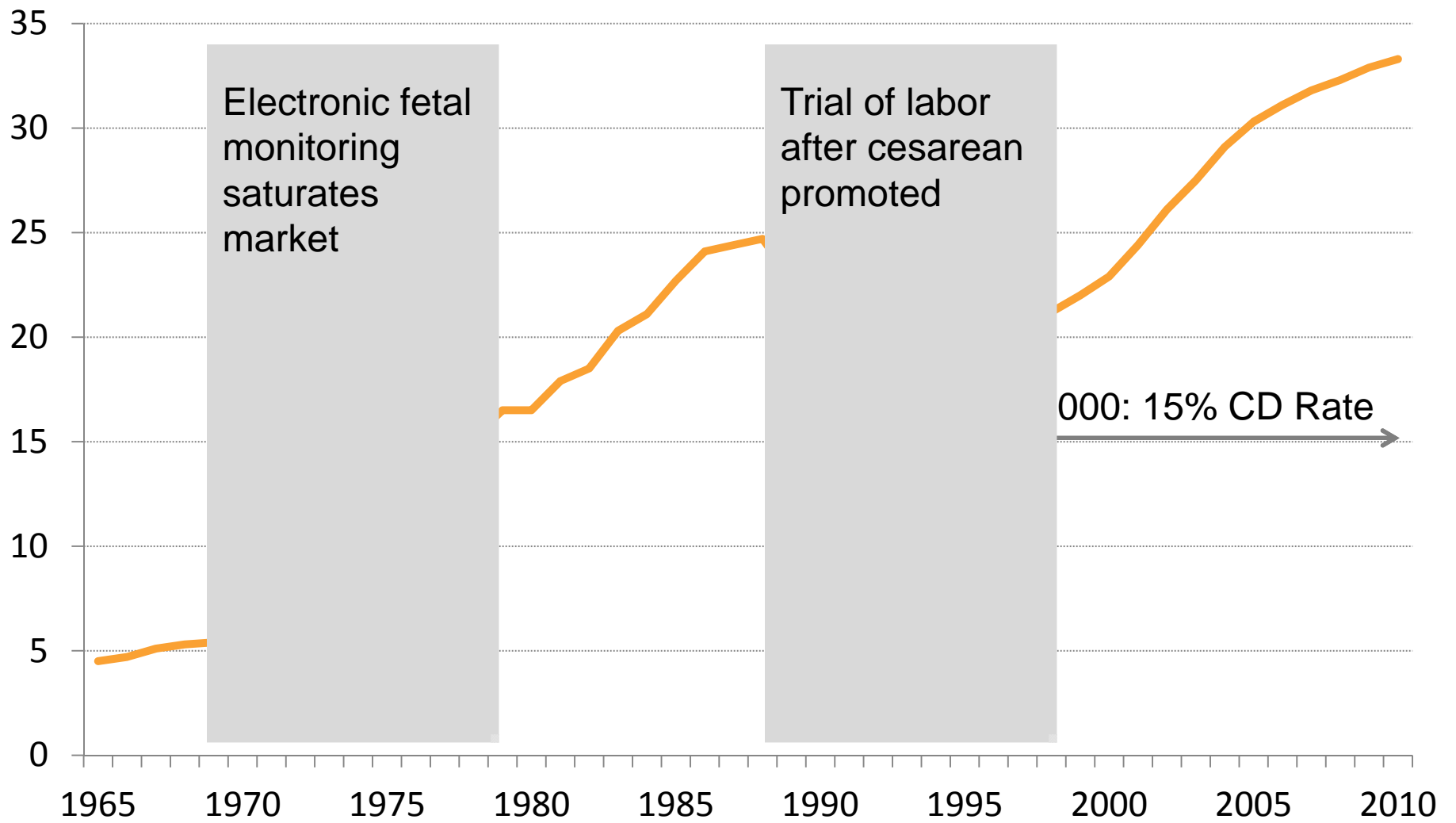


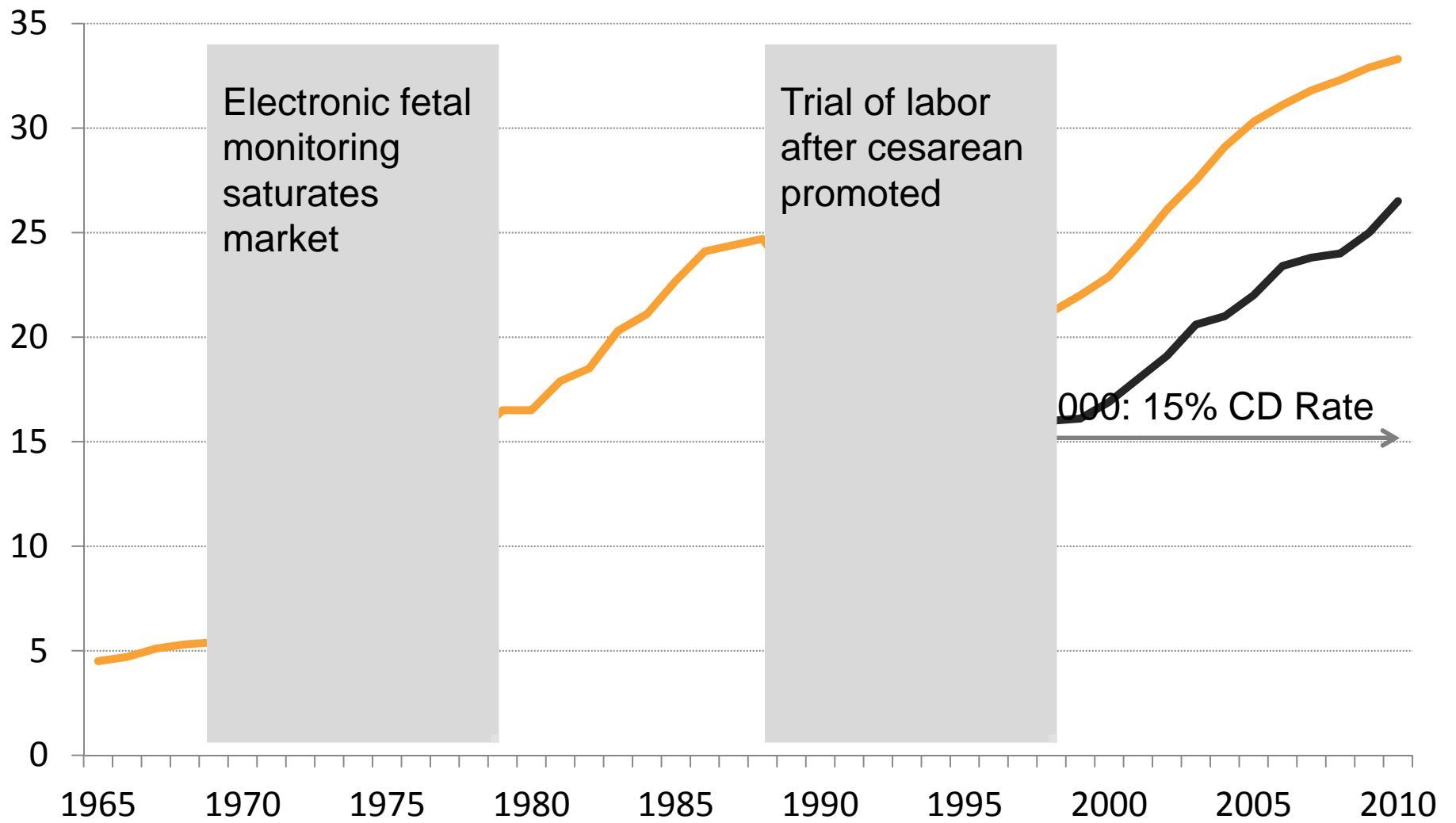
Beth Israel Deaconess
Medical Center


ARIADNE LABS









HOSPITAL

ENTRANCE

**The facility
is a risk factor**





Your Biggest C-Section Risk May Be Your Hospital

Consumer Reports finds that the rate of cesarean sections varies from hospital to hospital and state to state

By Tara Haelle

Last updated: April 13, 2016

The most common surgery performed in U.S. hospitals isn't on the heart or back or hips or knees. It's a C-section. Roughly one of every three babies born in this country, or about 1.3 million children each year, are now delivered by cesarean section.

While a number of factors can increase the chance of having a C-section—being older or heavier or having diabetes, for example—the biggest risk “may simply be which hospital a mother walks into to deliver her baby,” says Neel Shah, M.D., an assistant professor of obstetrics, gynecology, and reproductive biology at Harvard Medical School, who has studied C-section rates in this country and around the world.

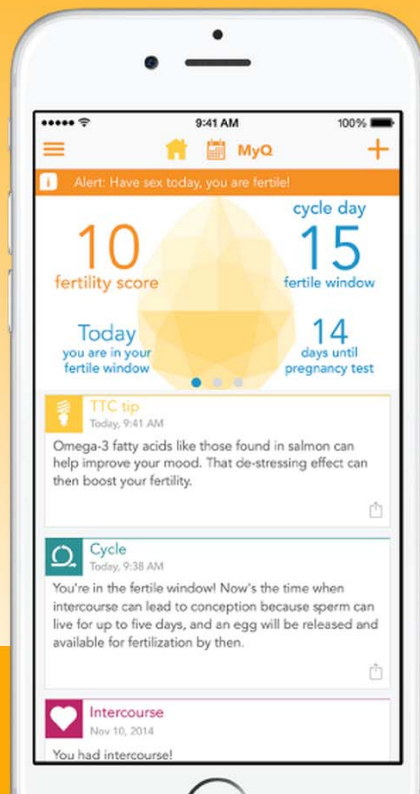
A new Consumer Reports investigation of more than 1,200 hospitals across the country supports that. It found that C-section rates for low-risk deliveries among U.S. hospitals vary dramatically, even in the same

Why is the facility a woman delivers at her **biggest risk factor** for major surgery?

How can we **help hospitals** improve?

How can we **help patients** choose better hospitals?

oviaTM fertility



Know when you're most fertile.

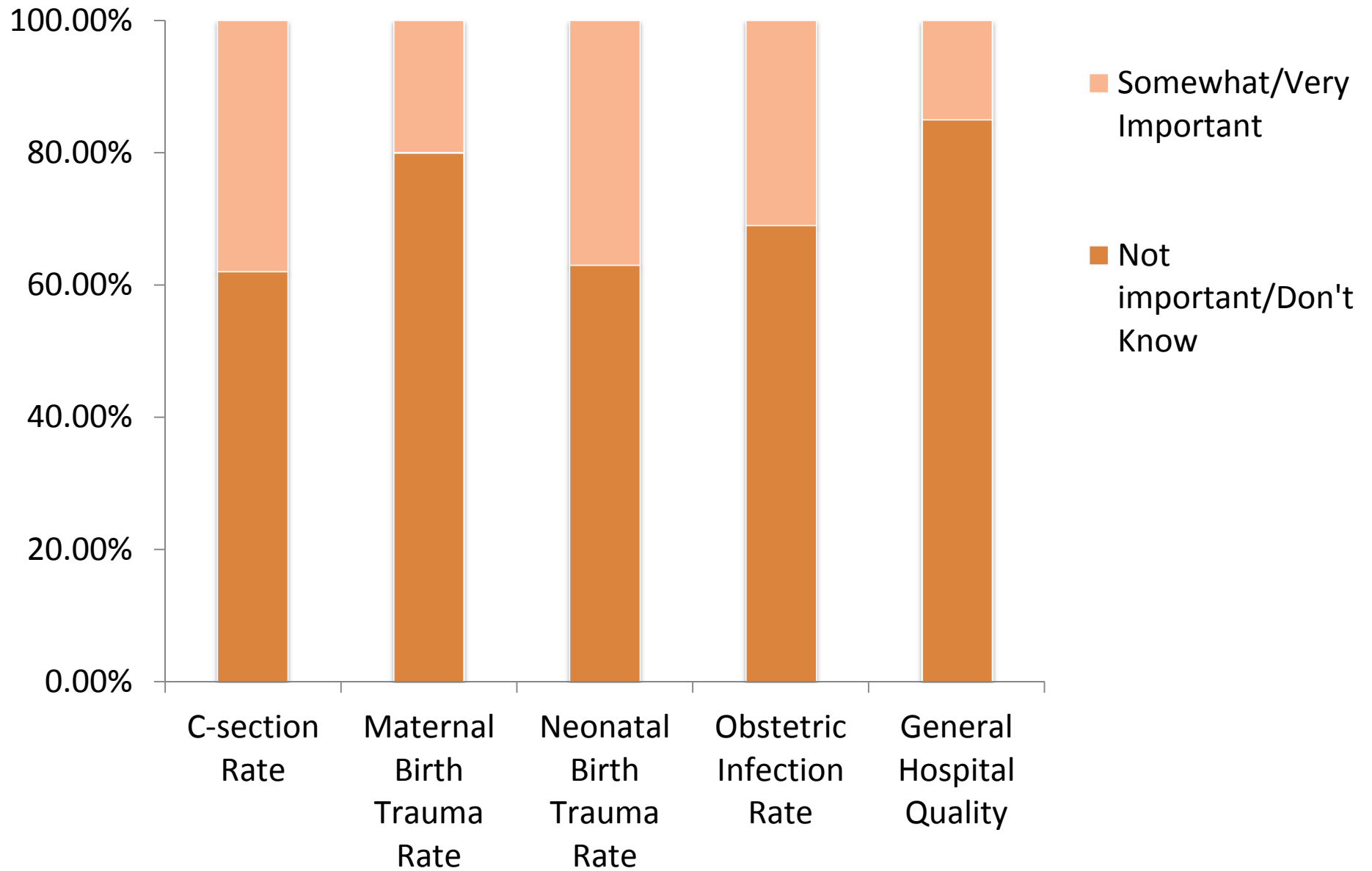
OviaTM Fertility gets to know your cycle so you can, too. Track your data,

73.2% emphasize
their choice of
OB/midwife over
hospital

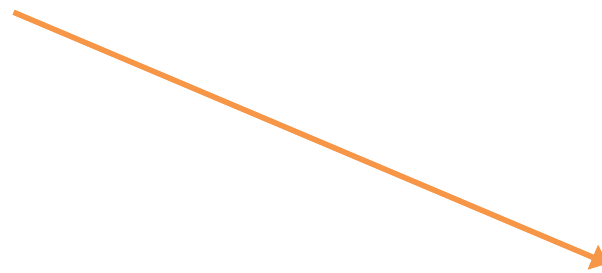
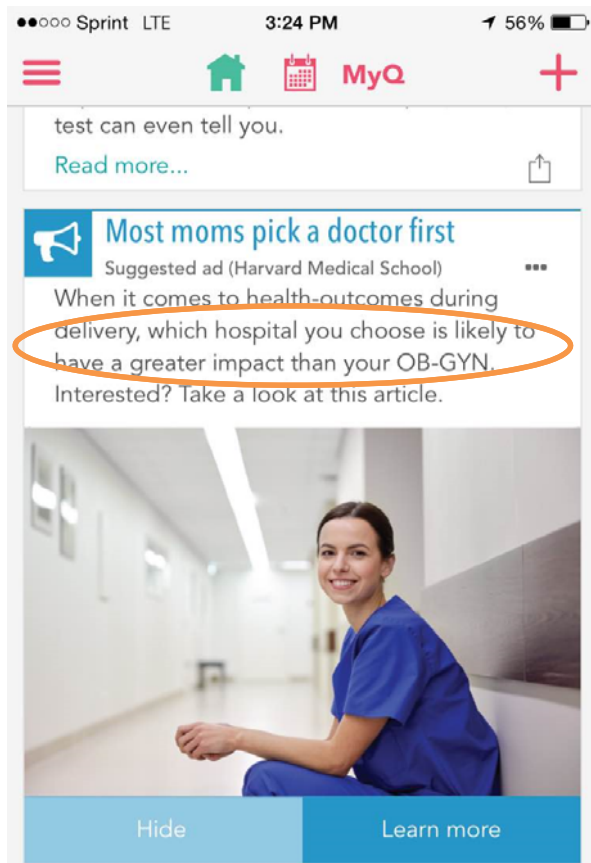
66.5% expect their
OB/midwife will
deliver their baby

55.1% do not believe
their choice of
hospital will impact
their chance of CD

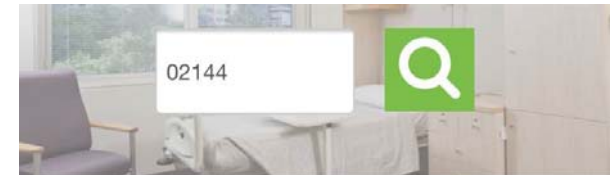
74.9% understand
that quality of care
varies across
hospitals—
few value existing
metrics



What makes Hospital A different from Hospital B?



Management



- = Rates of C-sections is acceptable
- = Hospital doing more C-sections than necessary
- = Hospital declined to respond

Dist.	Hospital Name	Rate of C-Sections
3 mi.	Cambridge Health Alliance: Cambridge	● 18.5%
4 mi.	Brigham And Women's Hospital	● 19.5%
2 mi.	Mount Auburn Hospital	● 20.9%
4 mi.	Beth Israel Deaconess Medical Center	● 24.7%
4 mi.	St. Elizabeth's Medical Center	● 25.7%
5 mi.	Hallmark Health System Melrose-Wakefield Hospital	● 26.9%
5 mi.	Boston Medical Center	● 29.6%
4 mi.	Winchester Hospital	● 33.3%
5 mi.	Tufts Medical Center	● 36.3%
4 mi.	Massachusetts General Hospital	● N/A

HOSPITAL

ENTRANCE

**The facility
is a risk factor**







“Darling, here’s the bill from the hospital. One more installment and the baby’s ours.”



STATEMENT OF ACCOUNT WITH HOSPITAL NAMED BELOW

ASSOCIATED HOSPITAL SERVICE OF PHILADELPHIA

112 SOUTH 18th STREET • PHILADELPHIA 2, PA. • LOCUST 4885

Patient Mrs. Reba [unclear] January 16, 1946

Subscriber Mr. Morris F. [unclear] 9088-10 160226
Cross No. Certificate No.

Address 4800 Westminister Ave. Hospital Temple University

City Philadelphia 31, Pa. City Philadelphia, Pa.

HOSPITAL CARE FROM	TO	STANDARD CHARGE	A. H. S. ALLOW.
NO. OF DAYS (FULL BENEFIT PERIOD)	11	35.00	60 00
NO. OF DAYS (25% BENEFIT PERIOD)	0		55 00
OPERATING ROOM AND DELIVERY ROOM (FULL BENEFIT PERIOD)		10 00	10 00
" " " " (25% BENEFIT PERIOD)			
ANESTHESIA (FULL BENEFIT PERIOD)		10 00	10 00
" " " " (25% BENEFIT PERIOD)			
SURGICAL DRESSING (FULL BENEFIT PERIOD)			
" " " " (25% BENEFIT PERIOD)			
DRUGS (FULL BENEFIT PERIOD)		3 50	3 50
" " " " (25% BENEFIT PERIOD)			
LABORATORY (FULL BENEFIT PERIOD)		10 00	8 00
" " " " (25% BENEFIT PERIOD)			
X-RAY (FULL BENEFIT PERIOD)			
" " " " (25% BENEFIT PERIOD)			
ELECTROCARDIOGRAM (FULL BENEFIT PERIOD)			
" " " " (25% BENEFIT PERIOD)			
BABAL METABOLISM (FULL BENEFIT PERIOD)			
" " " " (25% BENEFIT PERIOD)			
PHYSICAL THERAPY (FULL BENEFIT PERIOD)			
" " " " (25% BENEFIT PERIOD)			
Nursery		5 00	4 50
Circumcision		5 00	
Nurses Board		4 50	
Telephone		30	
TOTAL		108 80	
*** ALLOWANCE BY ASSOCIATED HOSPITAL SERVICE		***	91 00
BALANCE (PAID BY SUBSCRIBER TO HOSPITAL NAMED ABOVE)		17 80	

HOSPITAL SERVICES RENDERED TO ME FROM 1/11/46 TO 1/22/46 ARE

HEREBY ACKNOWLEDGED AS FULL BENEFITS UNDER THE TERMS OF YOUR HOSPITAL SERVICE PLAN.

CHARGES OF \$ 91.00 MADE BY THE HOSPITAL NAMED HEREON ARE ACKNOWLEDGED BY ME AS

A PERSONAL OBLIGATION FOR SERVICES NOT INCLUDED UNDER THE TERMS OF THE PLAN.

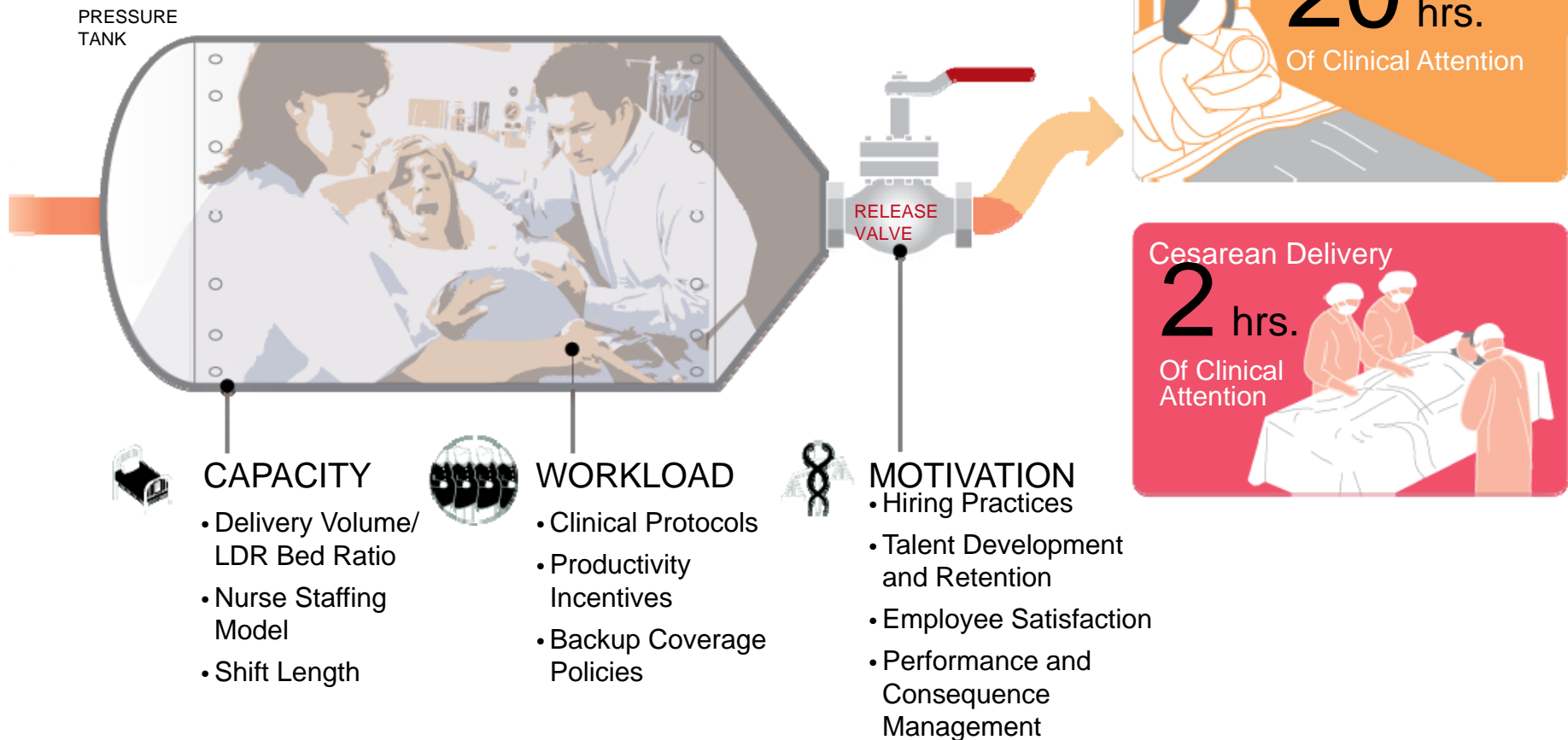
SIGNATURE OF SUBSCRIBER

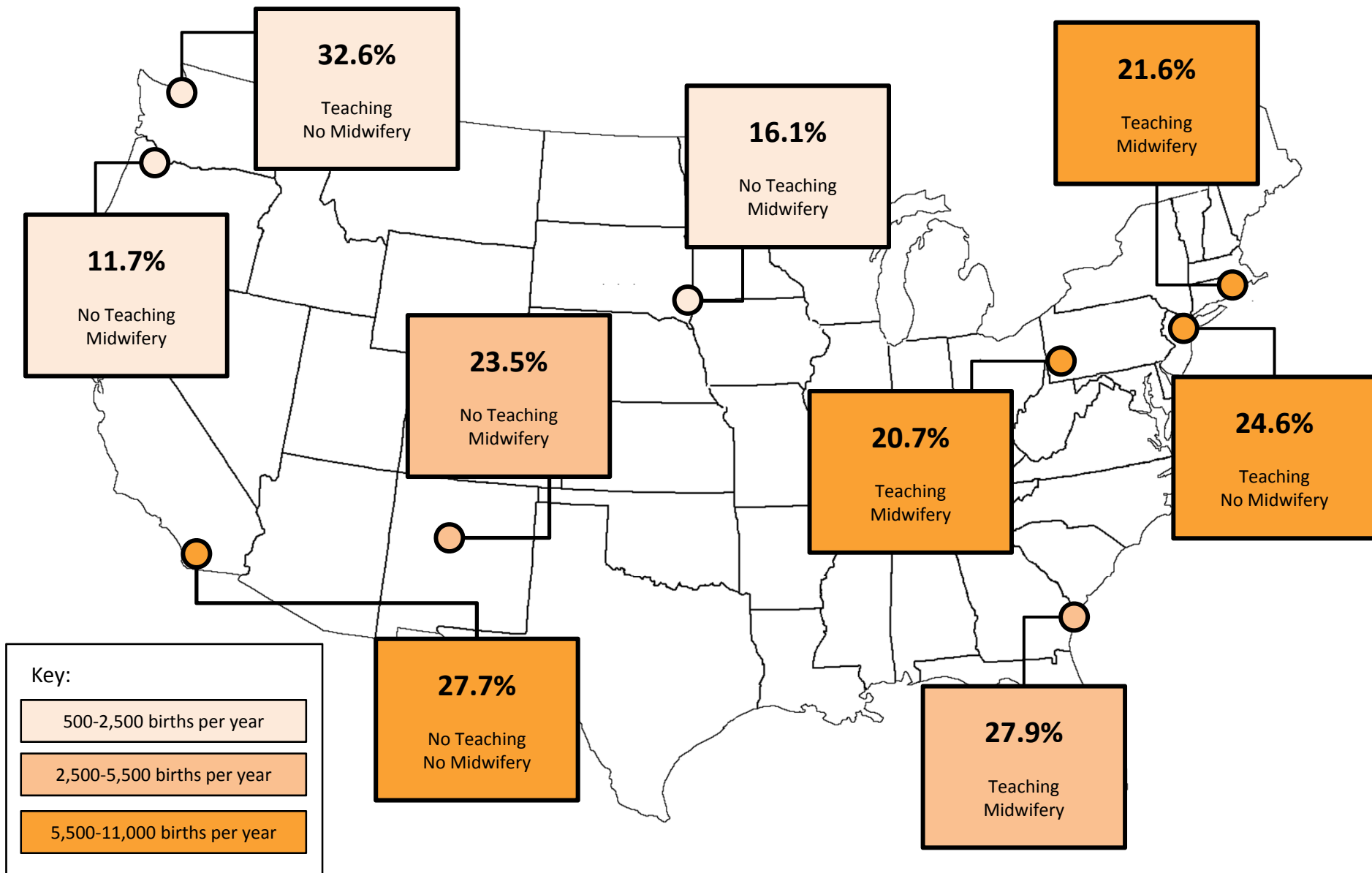
WE APPRECIATE YOUR COOPERATION IN BUILDING THIS NON-PROFIT COMMUNITY PLAN



Pressure Builds for a Delivery Decision

Three system factors that influence the decision between Vaginal vs. Cesarean Delivery





Patient Level Model

INPUTS

Patient Covariates:

- Age at admission
- Age squared
- Race (16.4% missing)
- Interaction of age & race
- Payer (3.3% missing)
- MS-DRG

Hospital Covariates:

- Teaching Status
- Total Deliveries (2013-2014)
- NICU Level

Hospital Management:

- Capacity
- Workload
- Motivation



OUTPUTS

C-section Rates / Length of Stay / Adverse Outcomes

Structure

Process

Outcome



(design)



(management)

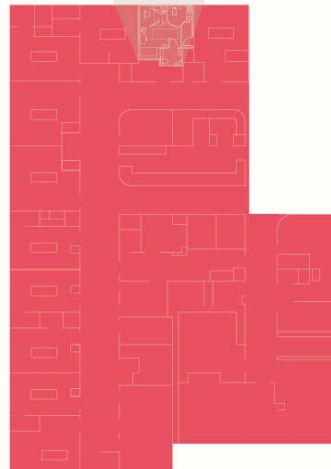


THE ROOM

Configuration & Size
Materials & Fixtures
Lighting



PATIENT

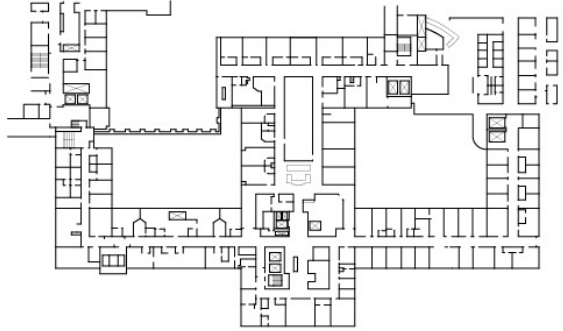
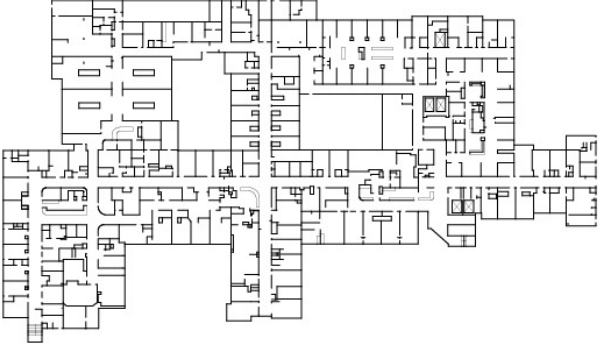


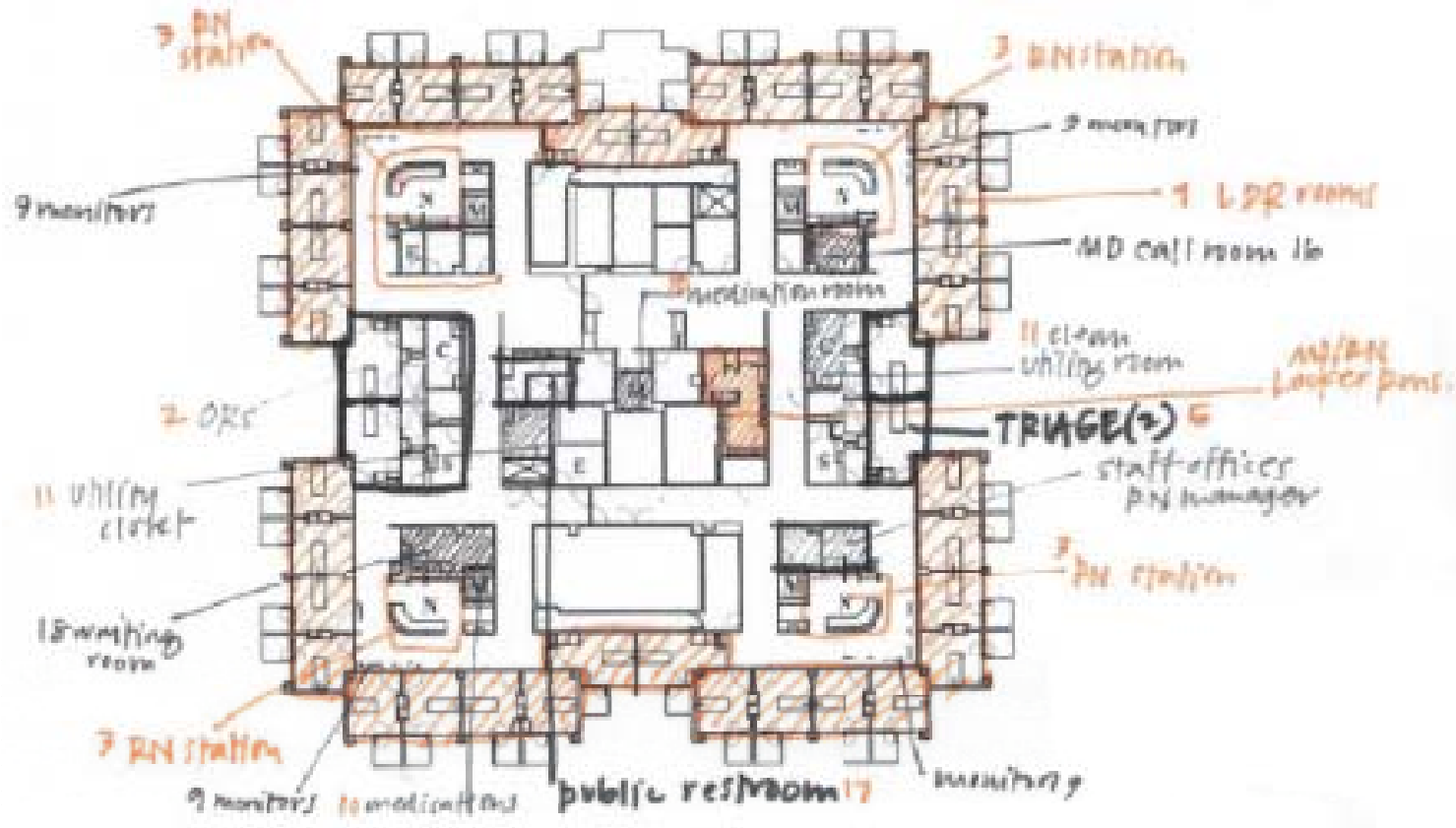
THE UNIT

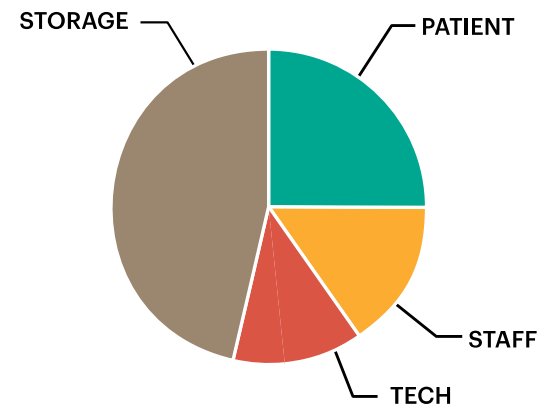
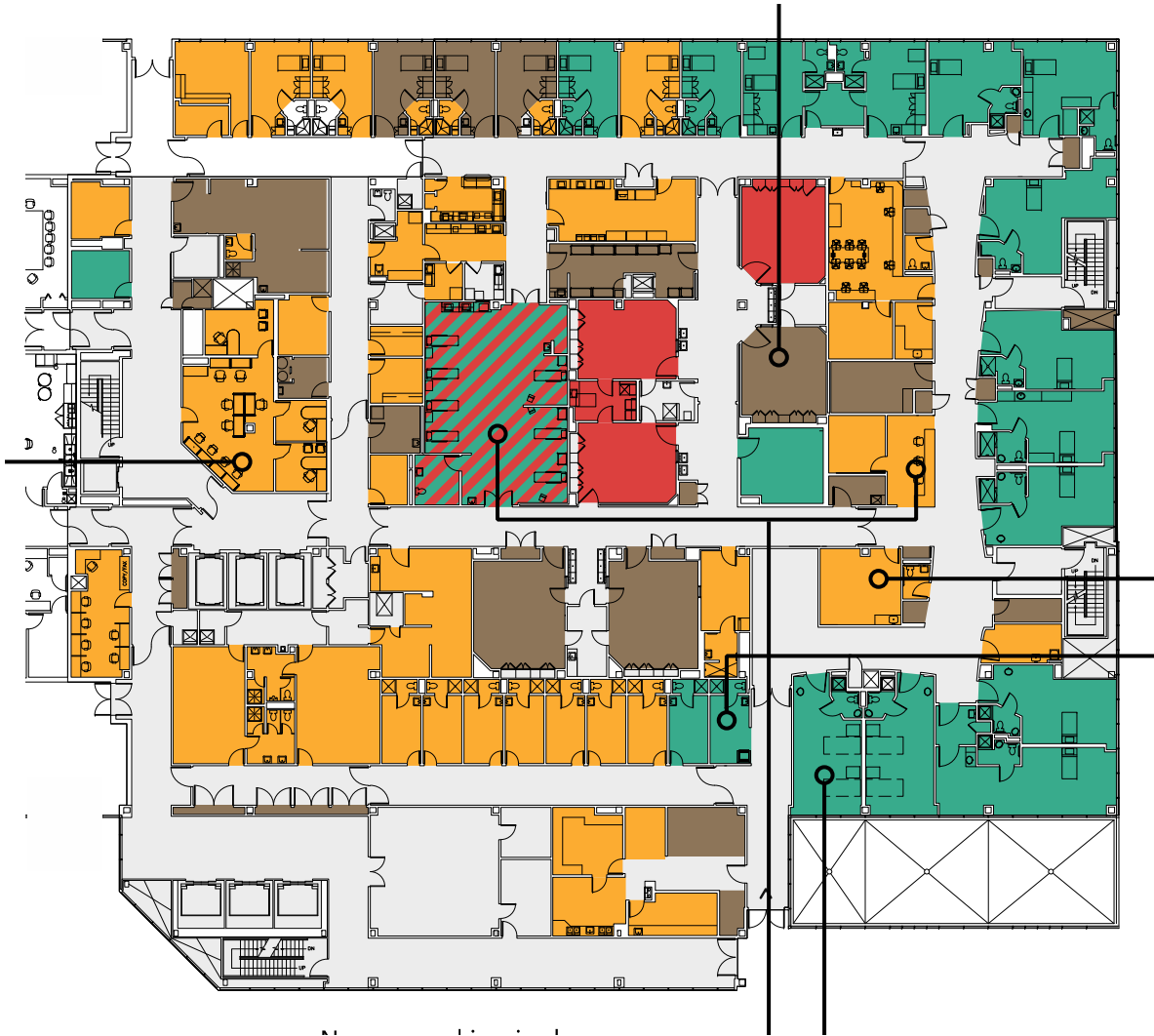
Bottlenecks
Shared Workspaces
Distance between Rooms



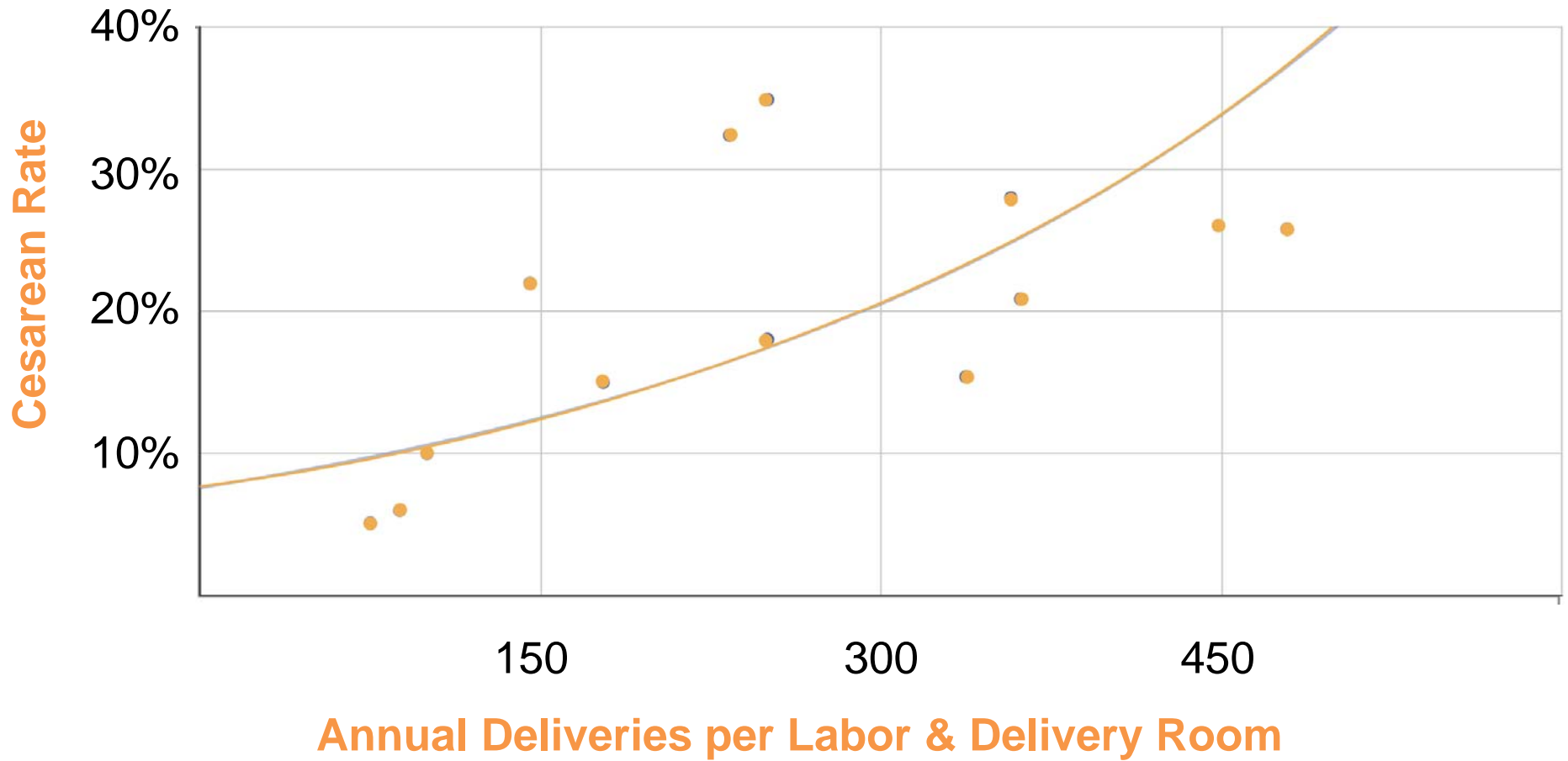
PROVIDER

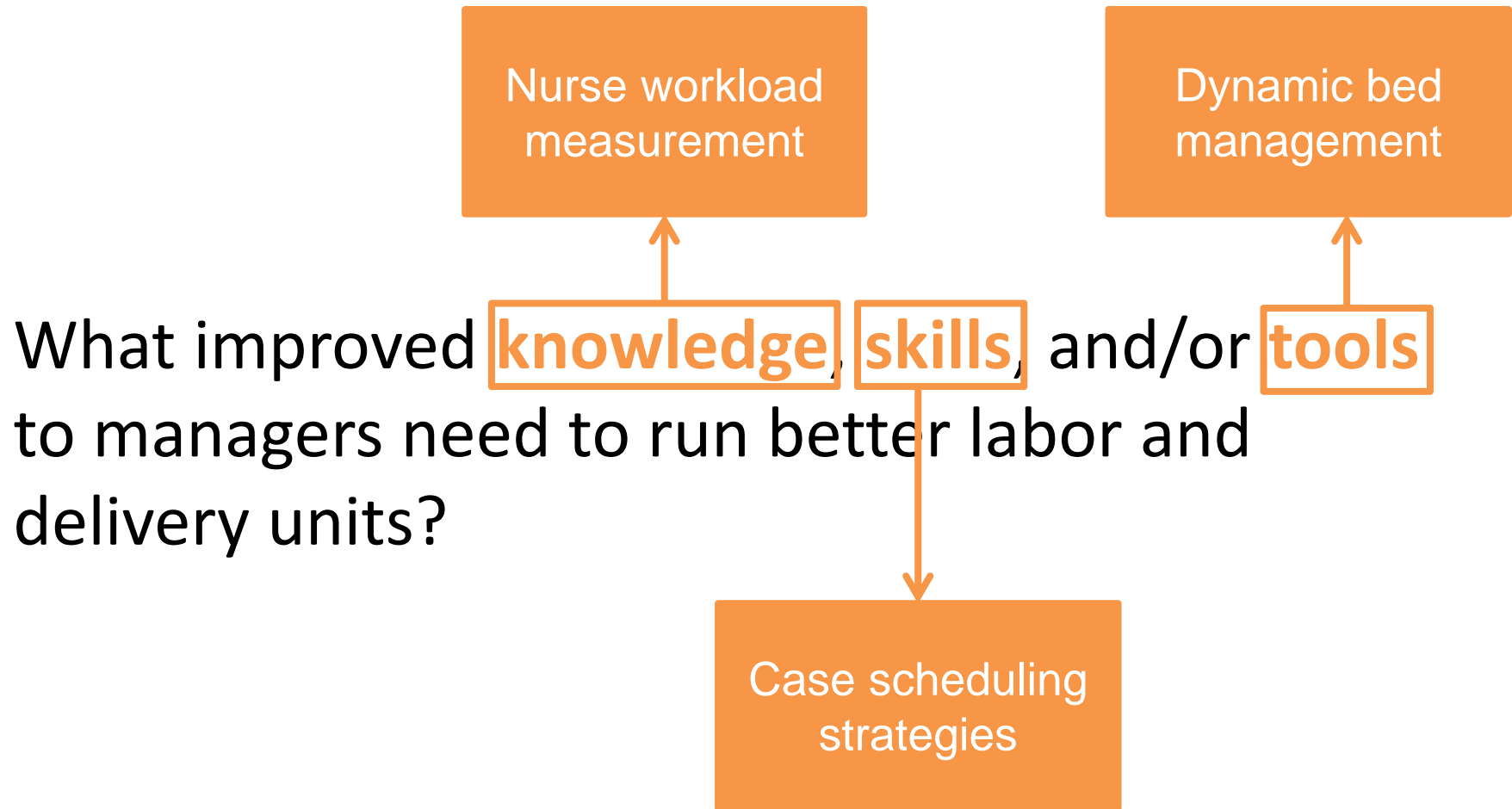




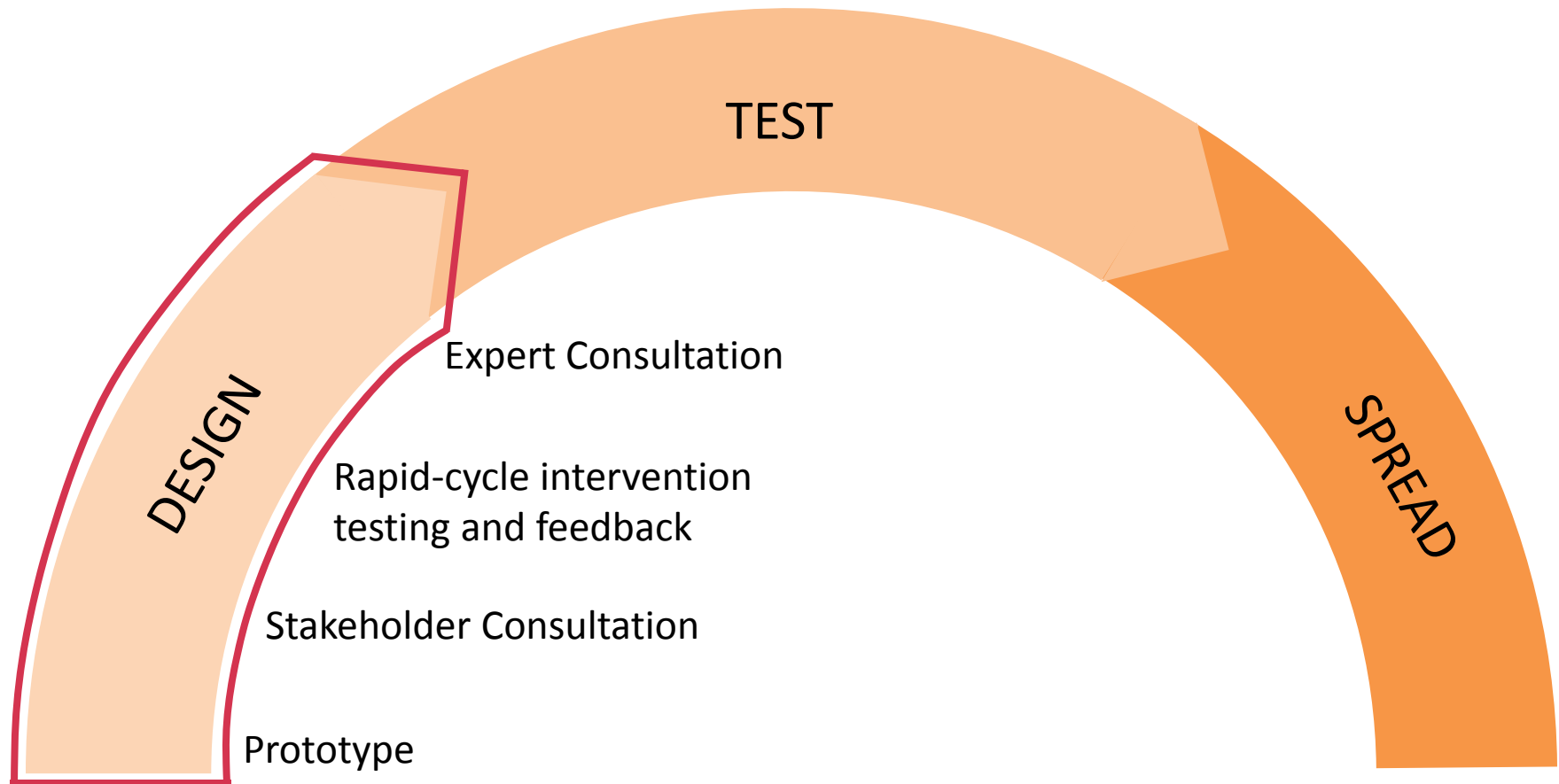


Room Demand vs. Cesarean Rate





Next Steps: Management Intervention





ARIADNE LABS