

Avoiding a Future Healthcare Dystopia: Evidence from Today's Healthcare Providers

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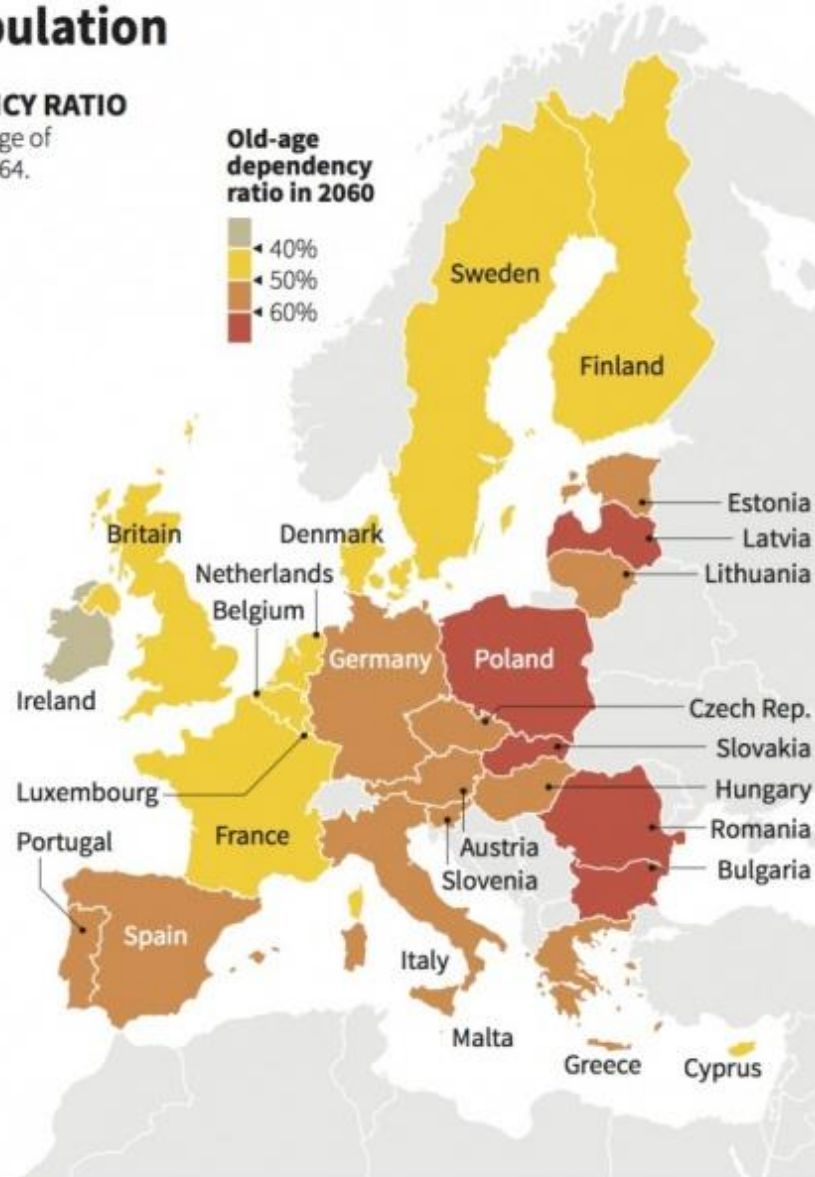
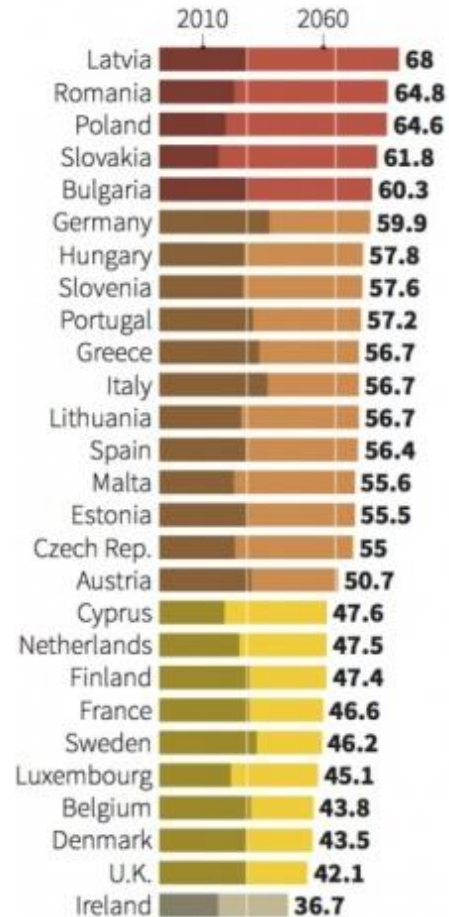
March 2018

Dismal science predicts dismal outcomes

Europe's ageing population

PROJECTED OLD-AGE DEPENDENCY RATIO

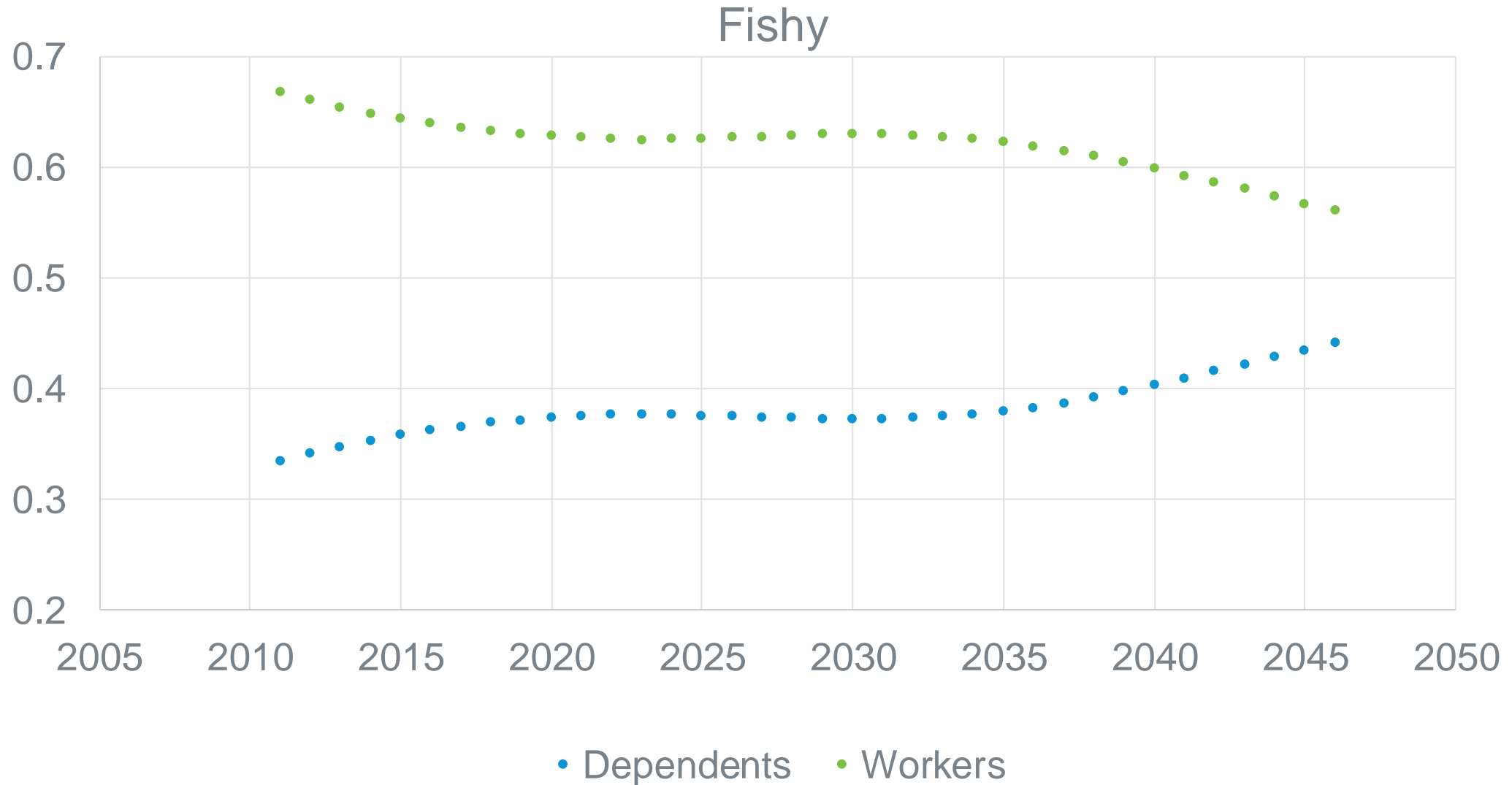
Number of persons aged 65 as a percentage of number of persons aged between 15 and 64.



‘Ageing is a process of exchanging hope for insight’

- Sheridan Hay

Dismal science predicts FISHY outcomes



'Greater demand for services, fewer people to fund and deliver them'

As life expectancy rises and fertility rate will stay under the natural replacement rate the ratio between the working-age and the retired population is expected to shrink in Europe.*



*Source: World Population Prospects, The 2015 Revision, United Nations

Reducing the quantity of 'time to care'

Exhibit ES-1: Total Projected Physician Shortfall Range, 2014-2025

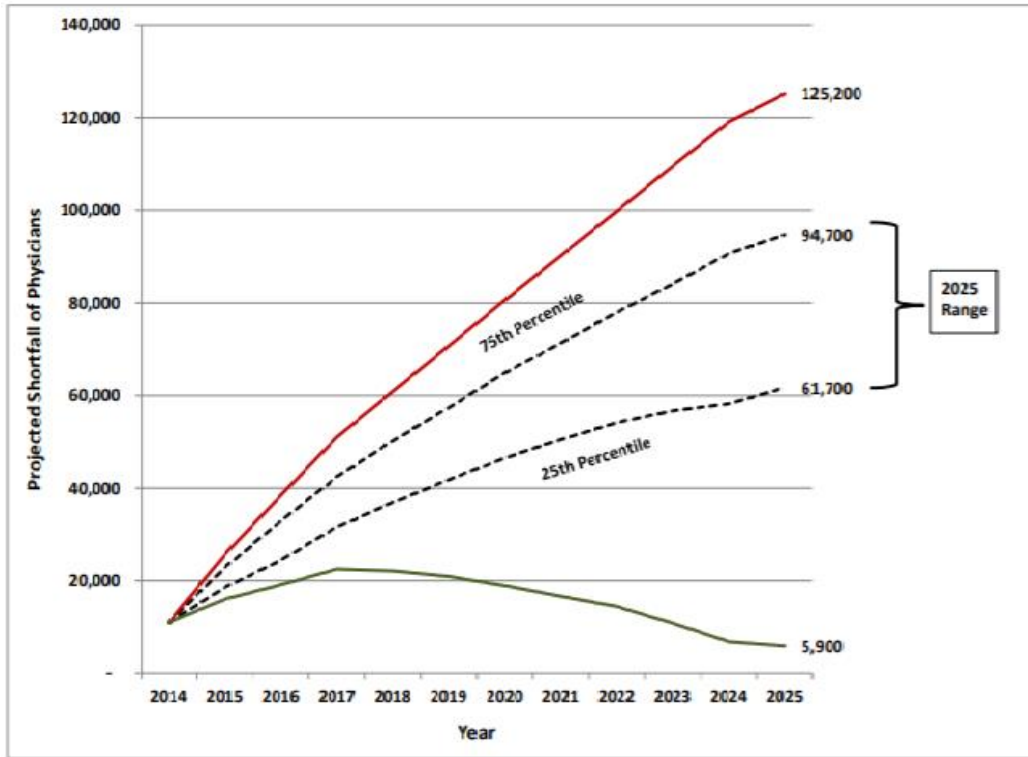


Exhibit ES-1: As complex systems have internal “checks and balances” to avoid extremes, we believe that the 25th to 75th percentile of the shortage projections continues to reflect a likely range for the projected adequacy of physician supply. For this update, that projected shortfall of total physicians is 61,700 to 94,700.

Source: Association of American Medical Colleges.

The Economist

A thinning front line

The NHS's latest problem: a shortage of GPs



Physicians: Burned Out, Overburdened, and in Short Supply

A dismal (or perhaps inexperienced) economist says 'increase supply'!...

Opinion: Giving pharmacists greater powers to help patients should be a no-brainer

With proper support, pharmacists could play a greater role in alleviating pressure on the healthcare system.

 News ▶ Health

Nurses and pharmacists believe independent prescribing can cure the NHS' ills

 > News

Meet the 105-year-old doctor who is still hard at work



..Or simply 'Reduce Demand'



Experience says we must do both: and insight shows that WE CAN!



Moving from

- Recording to Planning
- Being Transaction Orientated to Intelligence Orientated
- From treating the patients illness, to targeting the whole person
- From acute care management, to population health management

And delivering 'Supply' (Physician) and 'Demand' (Patient) benefits every, single, step of the way

Crawling: Improvements in 'Recording': A Full E.H.R



- Full Electronic Health Record for mothers and their babies
- First full EHRs in Public Hospitals in Ireland
- 4 sites; covering c40% of annual births



Crawling: Improvements in 'Recording': More time to care



Reduction in time spent writing the Nursing Narrative Note

- Pre MN-CMS
 - 11 Nurses
 - 77.4 minutes writing narrative per shift
- MN-CMS
 - 11 Nurses
 - 1.4 minutes on a narrative note per shift

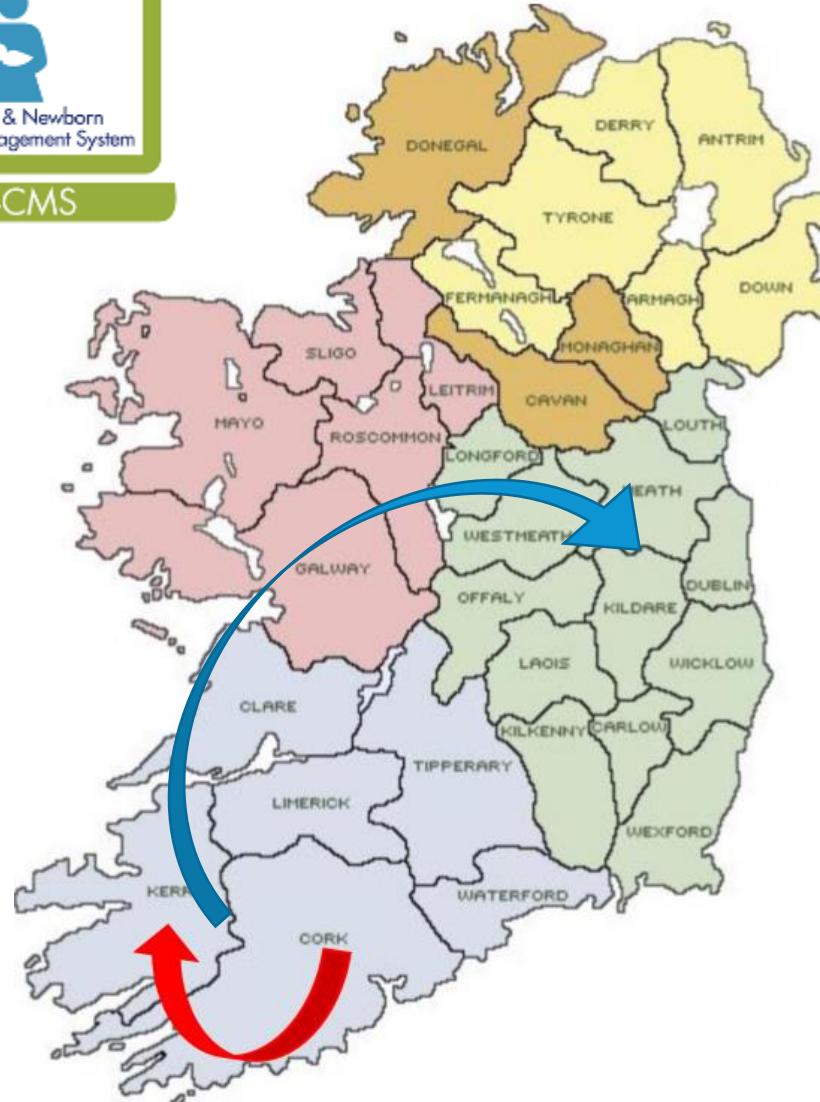


**13.9 hours
saving per
shift (76 mins per
nurse)**



#ECF18

Starting to Walk: Shareable, accessible records: more time to care



Walking: device integration directly to the record: more time to care (and safer too)

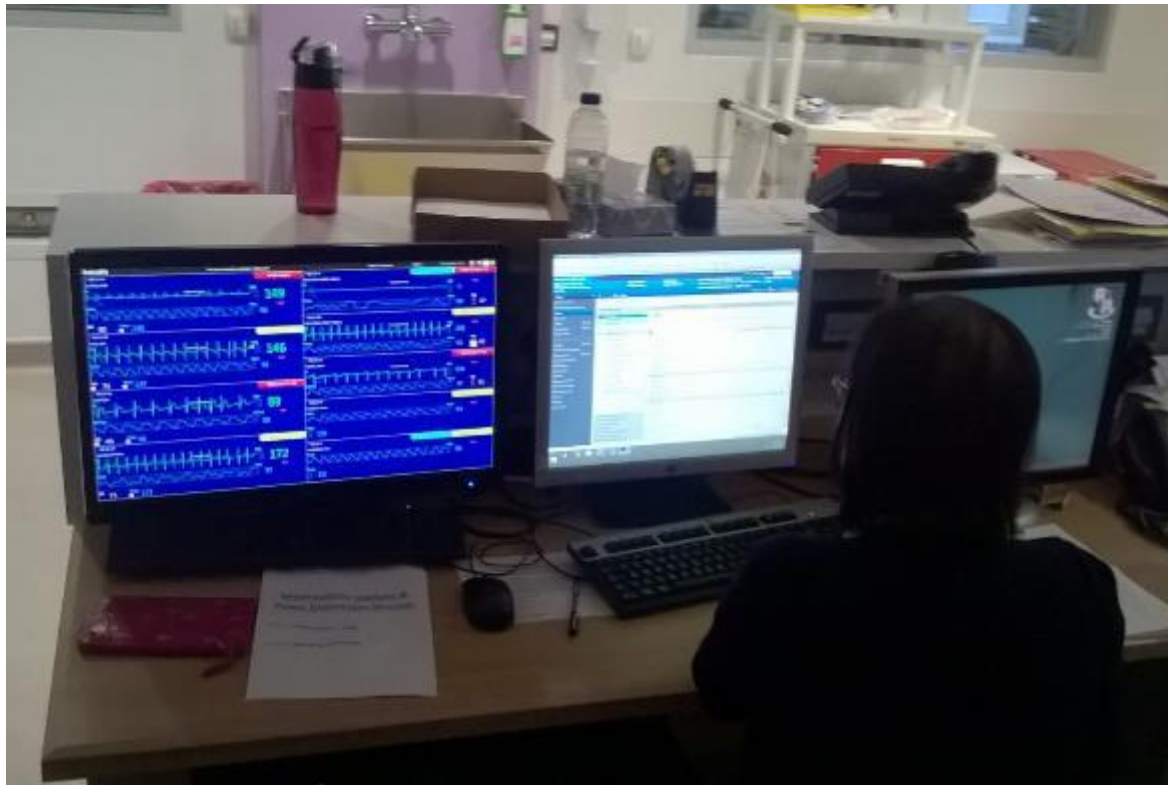


Imperial College Healthcare

NHS Trust

Bedside Medical Device Integration (BMDI):

- **53.5 percent reduction** in the time it takes providers to document a full set of **NEWS** — respiratory rate, oxygen saturations, temperature, systolic blood pressure, pulse rate and level of consciousness.
- Reduce transcription errors
- Earlier/increased identification of issues



Starting to run: Sepsis workflow



Improve quality of care through early identification and treatment for sepsis



21%

Reduced sepsis mortality by 21% from 6.3% to 5.2%



25 Lives Saved

25 lives were saved in one year with the Sepsis Program



5%

Reduced patient length of stay from 6.32 days per 1,000 patient days to 5.99days

Disclaimer: Not all clients will realize similar benefits due to scope of solutions and capabilities, business implementation models or organizational attributes.

Getting ready to Fly: Managing populations, one person at a time



SUMMARY

- Focused on raising pediatric asthma awareness in the communities and increasing preventive care.
- Bringing together external data consisting of labs, claims, and IPA sources for approximately 29,000 asthma patients, CHOC was able to further their knowledge about how to approach, diagnose, and treat pediatric asthma.
- Using well established clinical guidelines, CHOC partnered with Cerner to design the HealthIntent platform for Pediatric Registries and HealtheCare.

VALUE ACHIEVED

- 26% increase in Asthma Action Plans
- 47% increase in Asthma control Tests
- 80% reduction in school absenteeism
- **60% reduction in ED visits for asthma**
- 75% of their children have well-controlled asthma, more than double the national average

Aggregate and normalize



Create and apply intelligence



Act and measure





Know

identify and predict what will happen within your population



Engage

people, their family and care providers to take action



Manage

outcomes to improve health and care

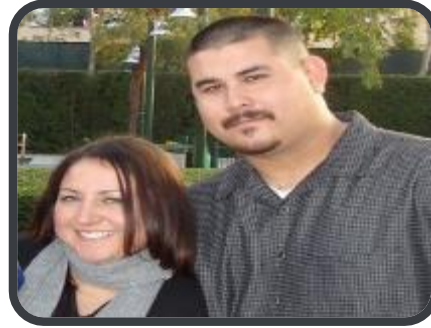
Meet Maria, 9 years old, and living with asthma



Meet Maria's Health team



Maria Cortez
Patient



Cristina and Julio
Parents



Lisa
School nurse



Dr Tupas
**Population Health
Medical Director**



Brenda
Care Coordinator



Dr Fortades
Paediatrician

Automatic alerts, or text messages, are sent to Mother, Father and the School Nurse to notify Maria's care team of the poor air quality (AQI > 230).



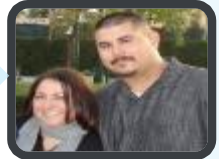
Dr. Fortades
PEDIATRICIAN



BREATHMOBILE



Lisa
SCHOOL NURSE



Cristina & Julio
MOTHER AND FATHER



Brenda
LVN CARE COORDINATOR



Maria Cortez
PATIENT



Dr. Tupas
MEDICAL DIRECTOR

Maria uses her Spirometer at school



The information provided below is in the electronic medical record. If you believe any data is incorrect, please notify the office.

Health Profile

The information provided below is in the electronic medical record. If you believe any data is incorrect, please notify the office.

Asthma Action Plan

Triggers

Smoke, Pollen, Mold, Exercise

Green Zone: Go! Peak Flow: 240 - 205

Symptoms:

- Breathing is easy.
- No cough or wheeze.
- Can sleep all night.

Date	Reading	Location
Yesterday	205	Home
Yesterday	210	Home

Yellow Zone: Caution Peak Flow: 205 - 155

Symptoms:

- First sign fo a cold.
- Cough or mild wheeze.
- Problems sleeping, working, or playing.
- Tight chest.

Date	Reading	Location
Today	180	School
Today	185	School

Red Zone: Emergency - Get Help Peak Flow: < 155

Symptoms:

- Can't talk, eat, or walk.
- Medicine not helping.
- Breathing hard and fast.
- Blue lips and fingernails.
- Tired or lethargic.
- Ribs show.

Date	Reading	Location
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Christina (Mum) logs into Maria's patient portal and see her daughter's peak flow readings

Alert Queue

Priority	Status	Patient & Subject	Received
Urgent Complete Message Call Comment	New	McBride, Lucas Call patient to assess respiratory status View Patient's Alerts	11:01 AM
Urgent Complete Message Call Comment	New	Cortez, Maria Call patient to assess respiratory status View Patient's Alerts	10:50 AM
Urgent Complete Message Call Comment	New	Abbot, Clark Questions about appointment this afternoon View Patient's Alerts	10:24 AM
Urgent Complete Message Call Comment	New	Morton, Latoya Consult report View Patient's Alerts	9:14 AM
Urgent Complete Message Call Comment	New	Hudson, Josh Questions about appointment this afternoon View Patient's Alerts	9:12 AM
Urgent Complete Message Call Comment	New	Fredricks, Paul Call patient to assess cough and shortness of breath View Patient's Alerts	8:38 AM



Dr. Fortades
PEDIATRICIAN




Lisa
SCHOOL NURSE



Brenda
CARE COORDINATOR



Maria
PATIENT



Dr. Tupas
MEDICAL DIRECTOR

Brenda (Care Manager) automatically notified that Maria is at risk

Brenda, drills down to look at Maria's asthma action plan



Cortez, Maria

MRN: 0003367222 9y DOB: 1/14/2005 F Next Appointment: In 7 Days
Address: 2345 N Bush Street Santa Ana, CA 92856 Phone: (714) 785-8097

Print Export Outreach

Alerts

Patient in yellow zone. Please have an evaluation completed and appointment within the next 24 hours.

Health Summary **Action Plan** Monitoring

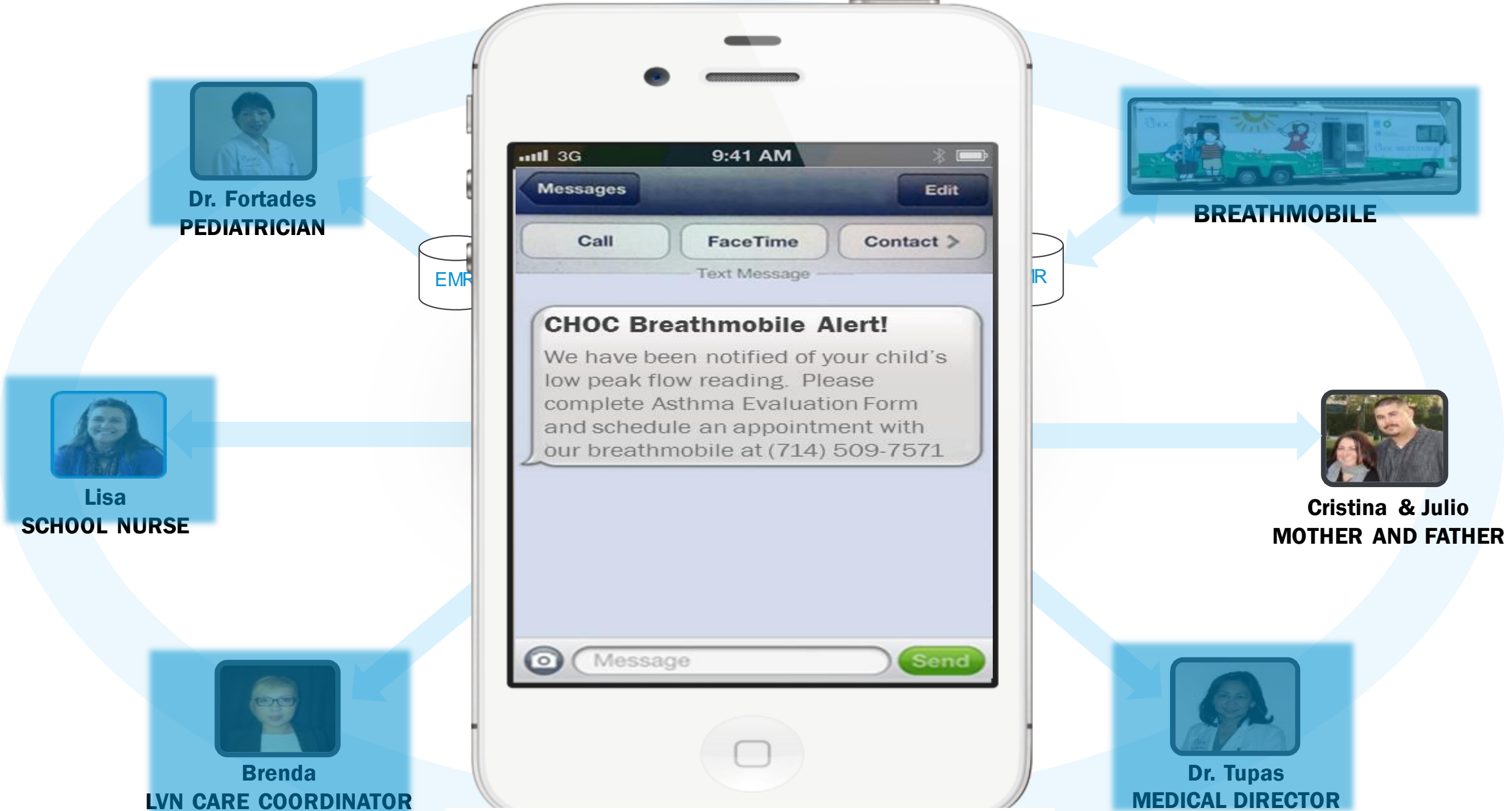
Asthma Action Plan

GREEN ZONE: Go	Inhaler Use	Peakflow Range: 240-205
Breathing is easy. No cough or wheeze. Can sleep all night.		205 School 2 months ago
		220 Home 3 months ago
		Personal Best 230 Home 4 months ago
YELLOW ZONE: Caution	Inhaler Use	Peakflow Range: 204-155
First sign of a cold	Albuterol School today	180 School today
Cough or mild wheeze	Albuterol Home 1 week ago	200 Home 1 week ago
Tight chest	Albuterol Home 3 weeks ago	190 Home 3 weeks ago
Problems sleeping, working, or playing	Albuterol School 2 months ago	
RED ZONE: Emergency-get help!	Inhaler Use	Peakflow Range: <155
Can't talk, eat, or walk Medicine not helping	Albuterol Home 8 months ago	140 Home 8 months ago

Triggers

- Smoke
- Pollen
- Mold
- Exercise

Brenda views Maria's asthma action plan



Brenda sends Christina a text message

PATIENT



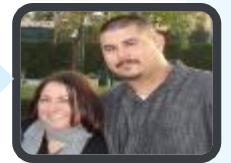
**Dr. Fortades
PEDIATRICIAN**



BREATHMOBILE



**Lisa
SCHOOL NURSE**



**Cristina & Julio
MOTHER AND FATHER**



**Maria Cortez
PATIENT**



**Dr. Tupas
MEDICAL DIRECTOR**

At the mobile clinic, the nurses use the EHR for scheduling

TOR

HealthRecord		
HARRIS, OLIVIA M 11 years F DOB: Jan 14, 2005		
Displaying	Overview ▾	
Results Most Recent		32
Estimated Creatinine Clearance	72.60 mL/min	Dec 5, 2015
Chief Complaint	Comprehensive Diabetic Exam	Dec 5, 2015
Glucose	43 mg/dL	Oct 27, 2015
Anion Gap	6	Sep 28, 2015
Basophils %	0.9 %	Sep 28, 2015
Basophils Absolute	0.1 x10 ³ /mcL	Sep 28, 2015
BUN	18 mg/dL	Sep 28, 2015
Calcium	9.5 mg/dL	Sep 28, 2015
Carbon Dioxide	25.0 mmol/L	Sep 28, 2015
Conditions Most Recent		2
Asthma		Aug 6, 2015
T1DM (type 1 diabetes mellitus)		May 25, 2013

Note sent automatically to Dr Fortades and the patient portal



**Dr. Fortades
PEDIATRICIAN**



BREATHMOBILE



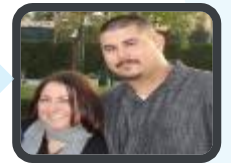
EMR



EMR



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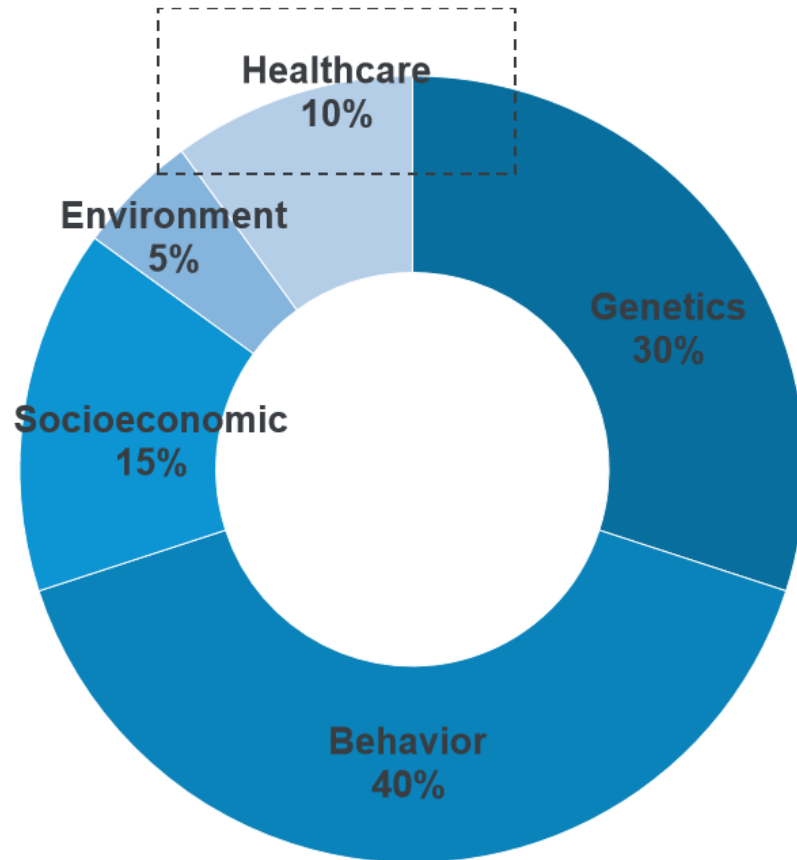


**Dr. Tupas
MEDICAL DIRECTOR**



**Maria Cortez
PATIENT**

“Flying”



What if we can ...

- Understand the other 90% of an individual's health?
- Create and improve existing prediction models adjusting for social determinates of health?
- Benchmark against national, state, city, county, and hospital level scores?
- Unlock geospatial features impacting health and provider outcomes?

Common Challenges

- Defining a strategy
- Stakeholders outside the hospital setting
- Funding and re-imburement models
- Skillsets – you need an economist!
- Data provenance
- Governance
- And more, but...

Think of all those we can learn from, and don't forget...

