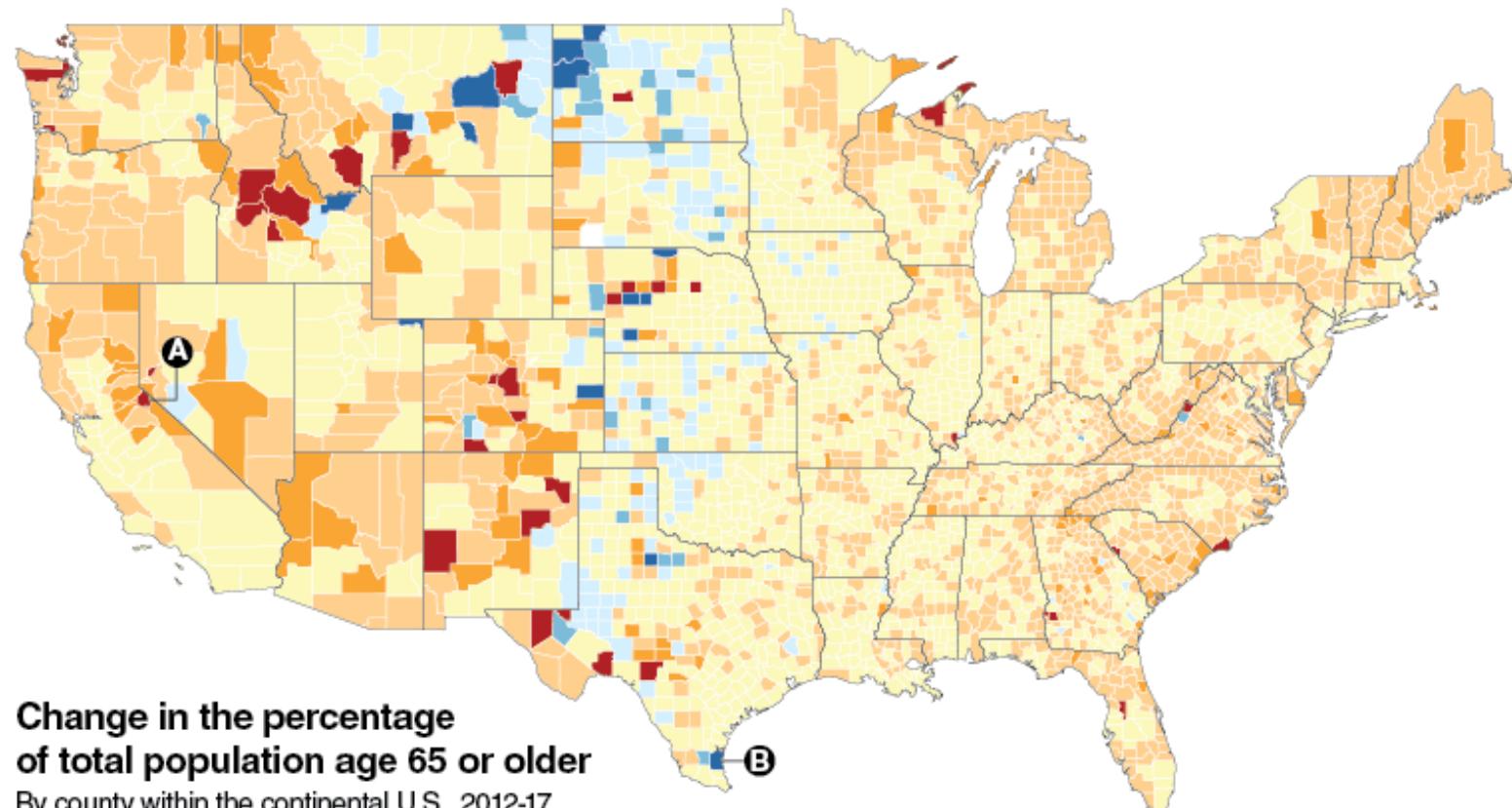


Riding the Silver Tsunami

Dr Tyrone Grandison

“The Silver Tsunami”

metaphor for the expected increase in the senior population



Change in the percentage of total population age 65 or older

By county within the continental U.S., 2012-17

Percentage-point change		2012	2017	%-point change
-4 or less	0.01 to 2			
-3.99 to -2	2.01 to 4			
-1.99 to 0	4.01 to 6			
More than 6				

Greatest increase*

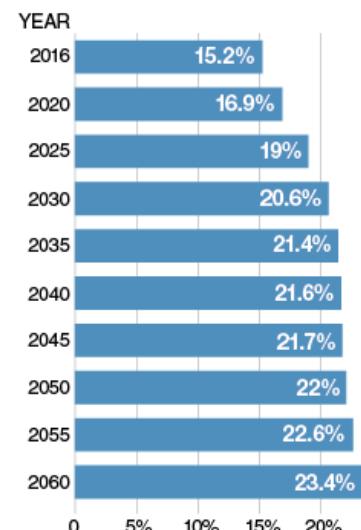
A Alpine County, Calif. 12.3% 27.5% +15.2

Greatest decrease*

B Kenedy County, Texas 21.5% 14.7% -6.8

* Among counties with at least 500 population in 2017

Projected
U.S. population age 65
and older as a percentage
of total population



[†]National Population Projections (revised)

Sources: Modern Healthcare, American
Community Survey five-year estimates, US Census
2017 National Population Projections (revised)

Populations are getting older



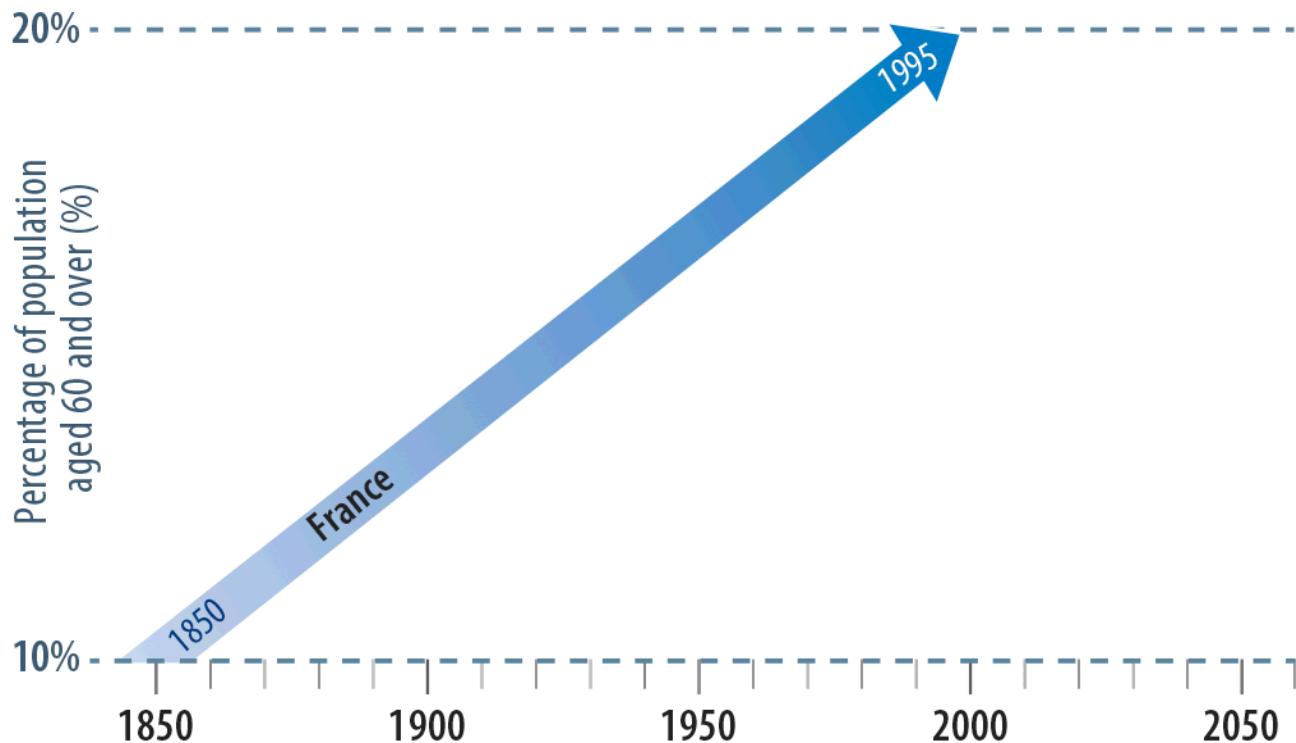
2015



World Health Organization

Speed of population ageing

Time for percentage of population **over age 60** to double



World Health Organization

AGEING and HEALTH



Between 2000 and 2050, the number of people aged 60 and over is expected to double

In 2050, more than 1 in 5 people will be 60 years or older.



By 2050, 80% of older people will be living in low- and middle-income countries.

Current American Development Paradigm

“meet the perceived needs of
families with children”



Impact

Policy: Predominance of single-family detached homes within auto-centric transportation networks and largely separated from commercial and industrial uses.

Environment: rapid land conversion, increased demands for energy and water, and growing carbon emissions.

Social: longer and more costly commutes, increased social isolation, higher infrastructure costs, greater dependency on automobiles for mobility and independence, and more financial vulnerability associated with housing costs.

Emerging American Development Paradigm

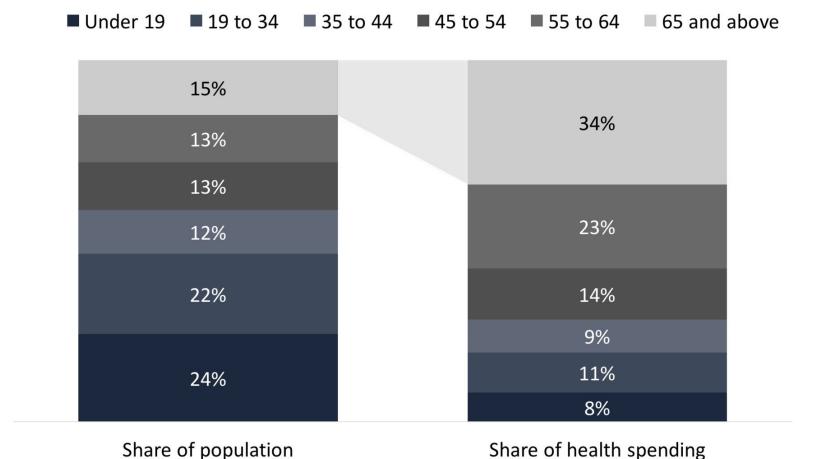
“meet the perceived needs of seniors”

Impact

All systems and arenas:

- Policy, Justice, Housing, Transportation, Healthcare, ...

US Seniors Account For The Largest Portion Of Healthcare Spending



Note: Data is for 2015, the most recent year available.
Source: Kaiser Family Foundation, 2017

1. *Total national health expenditures are \$4 billion today and \$5 billion by 2025 – US Census Bureau & CMS*
2. *National health expenditures as a percentage of GDP hit more than 15% in 2016, and that figure will climb to 19.4% of GDP (approximately \$6 trillion) in 2027 - CMS*
3. *Greater demand for long term care and care-at-home options*

BUSINESS
INSIDER
INTELLIGENCE

Long-Term Problems

More than half of U.S. adults at least 65 years old are projected to need nursing-home or other care services...

Length of care needed*

Five years
or more

14%

Two to
less than
five years

12%

Less than
two years

27%

No need
48%

...and the cost of care is steep for those who need it...

Projected spending on needed care

No care

48%

Less than \$10,000

5.7%

\$10,000-\$49,999

9.7%

\$50,000-\$99,999

9.7%

\$100,000-\$249,999

11.7%

\$250,000 or more

15.2%

...so millions of Americans have bought long-term-care coverage.

Long Term Care

“... the current system as structured is being stressed to its limits and its functioning is inadequate, with serious problems in cost and financing, and in access to and quality of, long-term care services”*

*Institute of Medicine, "[Toward a National Strategy for Long-Term Care of the Elderly: A Study Plan for Evaluation of New Policy Options for the Future](#)". National Academies Press.

Current Problems in Long Term Care

- Demand significant exceeds supply
- Lack of standards and adoption
- Facility Preparedness
 - Shortage of staff at LTC facilities,
 - Facility occupancy averaged ninety percent annually
 - Low process maturity
 - Technology Coherence
 - Technology Maturity
 - Timeframe for application and approval takes months



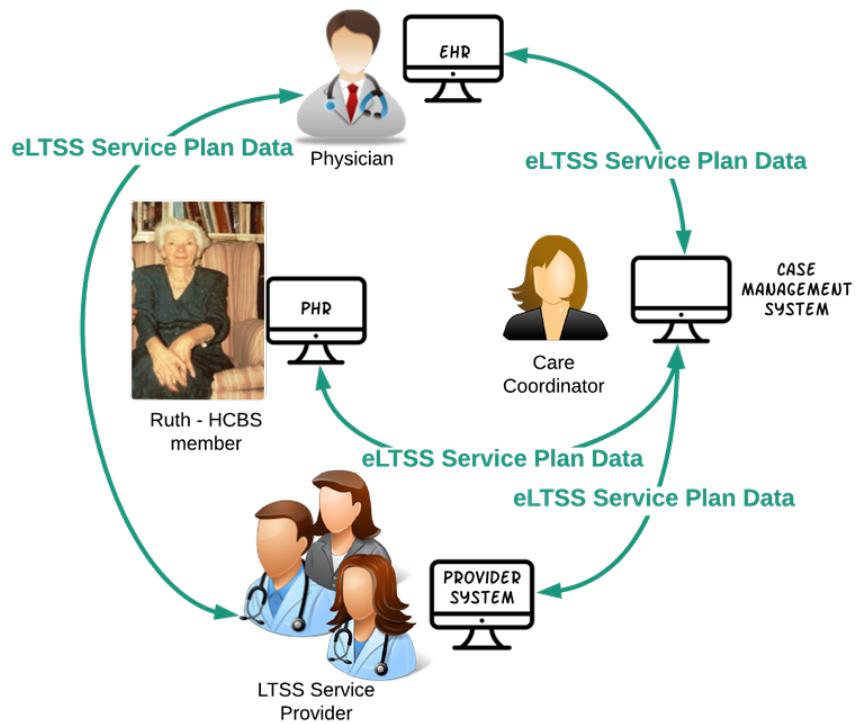
Long Term Care, Technology & Data

“Limited adoption and use of Health Information Technology and quality measurement”

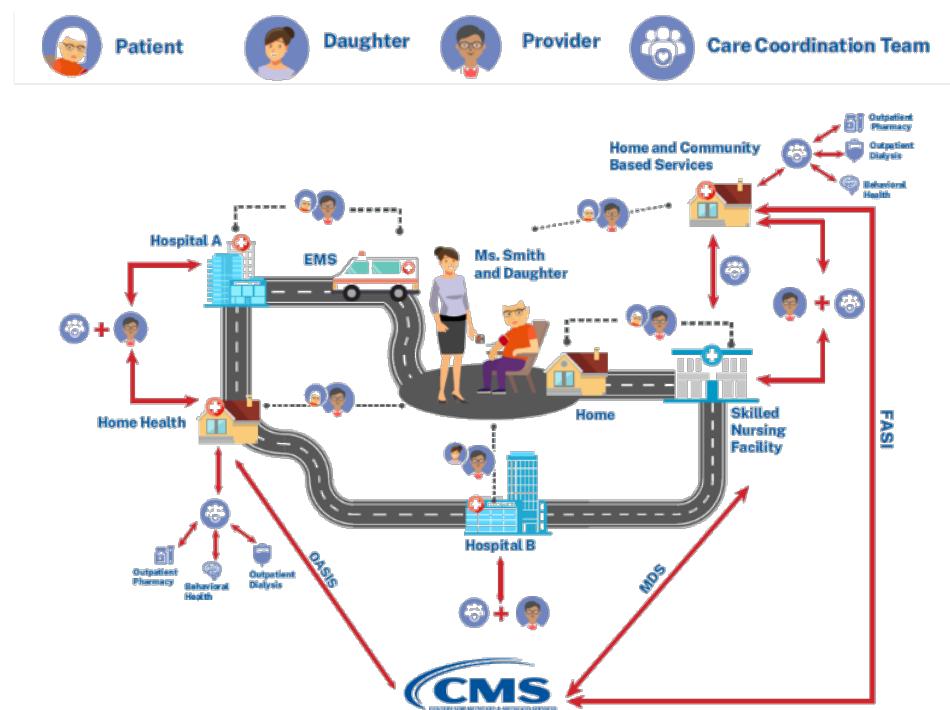
- Insufficient business and/or financial incentives for service providers to acquire and use health IT to support coordination of services
- Minimal national standards for quality measurement in LTSS outcomes
- Lack of uniformity in the terminology and definitions of data elements
- Lack of consensus on the interrelationships between a beneficiary's plans across care, services and supports;
- Lack of evidence and understanding of how health IT may benefit the beneficiary and encourage their adoption and use of technology.

- Office of the National Coordinator for Health Information Technology

Current Solution Initiatives



electronic Long-Term Services and Supports (eLTSS) Initiative



The PACIO Project

Initiatives' Focus Areas

eLTSS	The PACIO Project
<ul style="list-style-type: none">• LTSS Eligibility Determination, eLTSS Plan Creation and Approval• Sharing a Person-Centered eLTSS Plan	<ul style="list-style-type: none">• (Post-Acute) Care Coordination

A photograph showing a group of six diverse seniors (three men and three women) gathered around a dark wooden table. They are all holding hands in a circular pattern, suggesting a sense of community and support. The individuals are dressed in casual clothing, and the setting appears to be an indoor room with a concrete wall in the background.

Project Focus

Speed up the intake and onboarding
for a senior entering a care home

Long Term Goal

LTC_CAP aims to develop a FHIR resource specification, and associated enabling technologies, for a senior that has found a care home and is in the process of securing their place in that home.

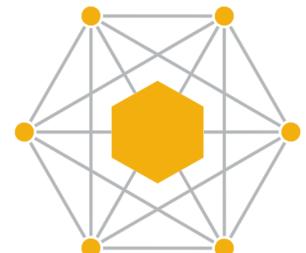
Methodology

Use existing knowledge and tools, while collaborating with LTC facility providers on a useful end-result for them



LTC Facility (19)

eLTSS
Initiative



The PACIO Project



**HEALTH
SAMURAI**

Current Status

1. Collaborating with our 19 LTC facility providers, we identified an initial set of common data elements.
2. Created a generic database schema for this initial set.
3. Cross-referenced this initial set against the work done by the PACIO project and the CMS Data Element Library to determine the FHIR resources that need to be incorporated.
4. Documented a draft LTCFacilityApplication FHIR specification.

Current Status

5. Used Health Samurai’s IGPOP tool to craft a draft FHIR implementation guide. Imported into Health Samurai’s FHIRBase tool.
 - The use of FHIRBase allows the data from Pearl Long Term Care Solutions (“Pearl”) to be read by our authorized provider partners.
6. Ongoing work to create a translator (in Python) that converts from Pearl’s internal data system (a mix of MySQL and Mongo DB) into the draft FHIR spec.
7. Open sourced and assets available via [Github](#).

Structure Definition

```
<LTCFacilityApplication xmlns="http://hl7.org/fhir">
  <!-- from Resource: id, meta, implicitRules, and language -->
  <!-- from DomainResource: text, contained, extension, and modifierExtension -->
<identifier /><!-- 1..* Identifier An identifier for this facility application -->
<ltcFacility /><!-- 1..* Reference(Organization) The LTC Facility being applied to -->
<resident /><!-- 1..* Reference(Patient) The person who is applying to this LTC Facility ('the prospective resident') -->
<familyMember /><!-- 0..* Reference(RelatedPerson) Family member of the prospective resident -->
<housingPreference value="[code]" /><!-- 0..* studio | one-bedroom | two-bedroom | shared -->
<desiredCareLevel value="[code]" /><!-- 1..* independent-living | assisted-living | skilled-nursing | memory-care -->
<insurance /><!-- 1..* Reference(Coverage) The insurance coverage details for the prospective resident -->
<careProvider /><!-- 0..* Reference(Practitioner) The care provider for the prospective resident -->
<careTeam /><!-- 0..* Reference(CareTeam) The care team for the prospective resident -->
<carePlan /><!-- 0..* Reference(CarePlan) The care plan for the prospective resident -->
<preferredHospital /><!-- 0..* Reference(Organization) The preferred hospital for the prospective resident -->
<cognitiveStatus /><!-- 1..* Reference(Observation) The cognitive status test results for the prospective resident -->
<functionalStatus /><!-- 1..* Reference(Observation) The functional status test results for the prospective resident -->
<advanceDirective /><!-- 1..* Reference(Person) The advance directives for the prospective resident -->
<hospitalizations /><!-- 0..* Reference(Encounter|Procedure) The past hospitalizations for the prospective resident -->
<currentAllergies /><!-- 0..* Reference(AllergyIntolerance) The current allergy for the prospective resident -->
<currentConditions /><!-- 0..* Reference(Conditions|QuestionnaireResponse) The current medical and SDM conditions for the prospective resident -->
<currentMedications /><!-- 0..* Reference(Medication) The current medications for the prospective resident -->
<dietaryPreferences /><!-- 0..* Reference(NutritionOrder) The dietary preferences for the prospective resident -->
<powerofAttorney /><!-- 1..* Reference(Person) Power of attorney for the prospective resident -->
<veteran value="[boolean]" /><!-- 0..1 Whether the prospective resident is a veteran -->
<bringPets value="[boolean]" /><!-- 0..1 Whether the prospective resident will be bringing pets -->
<ownCar value="[boolean]" /><!-- 0..1 Whether the prospective resident owns a car -->
<driveRegularly value="[boolean]" /><!-- 0..1 Whether the prospective resident drives regularly -->
<intendsToMaintainCar value="[boolean]" /><!-- 0..1 Whether the prospective resident intends to maintain a car -->
<reasonableAccommodation value="[boolean]" /><!-- 0..1 Whether the prospective resident is in need of a reasonable accommodation for a disability, e.g. an apartment feature that helps with a hearing, mobility or vision impairment -->
<motorizedDevice value="[boolean]" /><!-- 0..1 Whether the prospective resident has an electric wheelchair, motorized cart or similar motorized device -->
<historyOfIntellectualDisability value="[boolean]" /><!-- 0..1 Whether the prospective resident has a history of intellectual or developmental disability issues -->
<historyOfMentalHealth value="[boolean]" /><!-- 0..1 Whether the prospective resident has a history of mental health issues -->
<historyOfSubstanceAbuse value="[boolean]" /><!-- 0..1 Whether the prospective resident has a history of substance abuse -->
<needsInterpreter value="[boolean]" /><!-- 0..1 Whether the prospective resident is in need of interpretive services -->
<helpWithMedications value="[boolean]" /><!-- 0..1 Whether the prospective resident require assistance to administer medication -->
<registeredOffender value="[boolean]" /><!-- 0..1 Whether the prospective resident is subject to a lifetime registration requirement under a state or federal sexual offender registration program -->
<personalReference /><!-- 0..* Reference(Person) Personal reference for the prospective resident -->
</LTCFacilityApplication>
```

Ask #1

LTC Facility Owners and Managers

Reach out and provide input on the data
you require during your application

Ask #2

LTC Facility Owners and Managers

Tell us about your systems and their FHIR capabilities

Ask #3

IT Vendors for LTC Facilities

Work with us on “translators”

A photograph showing the backs of four elderly men sitting on a long white wooden bench. They are all wearing light-colored sweaters and trousers. The bench is positioned on a cliff edge, overlooking a vast blue ocean under a bright, slightly cloudy sky.

Thank You

Email: ty@pearlltc.com LinkedIn: <http://www.linkedin/in/tgrandison>