

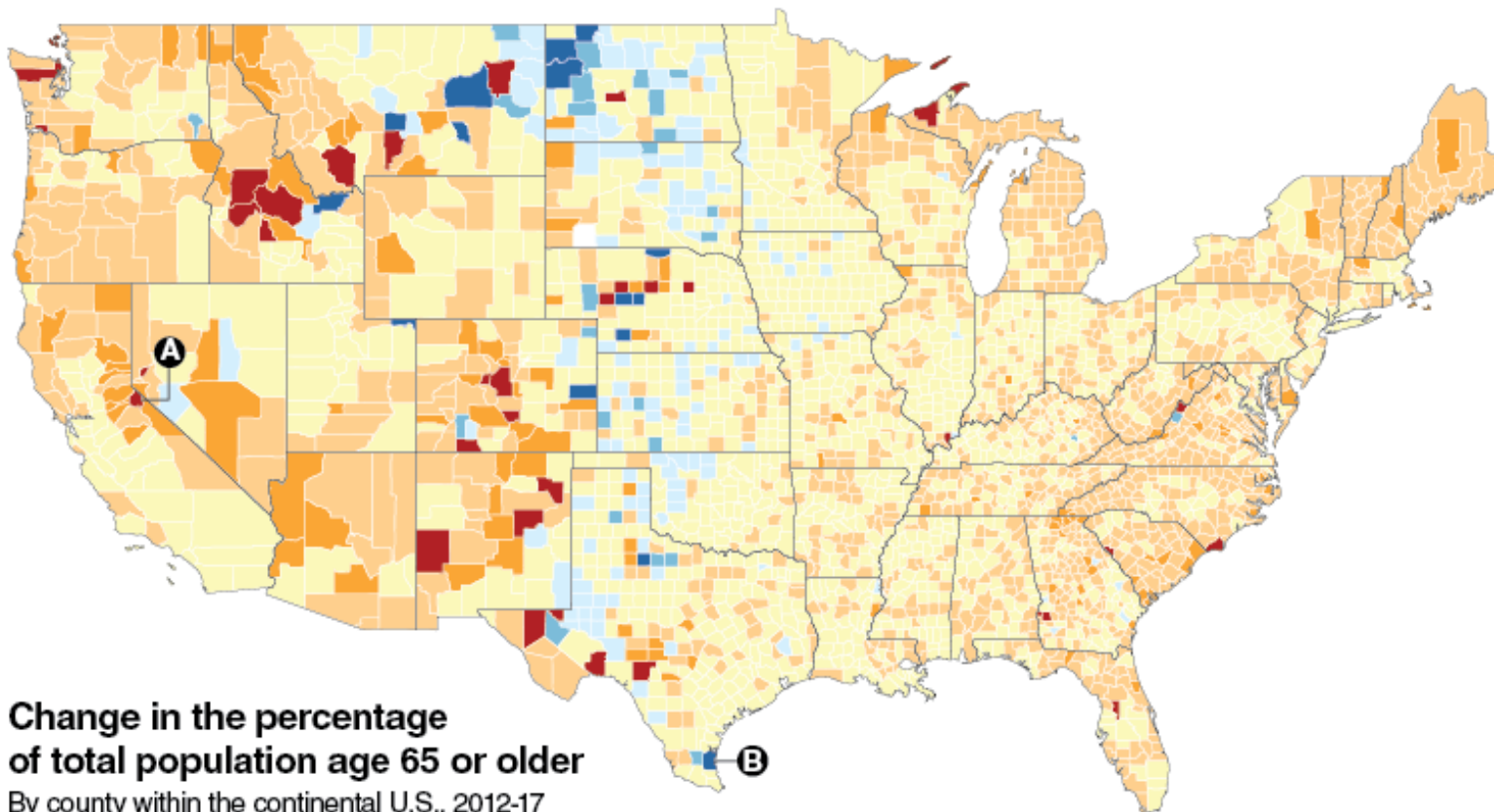
A man wearing a straw hat, sunglasses, and a blue and white patterned Hawaiian shirt is balancing on a large blue ball. He is holding a black cane in his left hand and has his right arm raised. The background features stylized blue waves and the number '65' repeated in various sizes and colors. A blue rectangular box is overlaid on the right side of the image, containing the title text.

# Riding the Silver Tsunami

**Dr Tyrone Grandison**  
Chief Technology Officer, Pearl Long Term Care Solutions

## “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

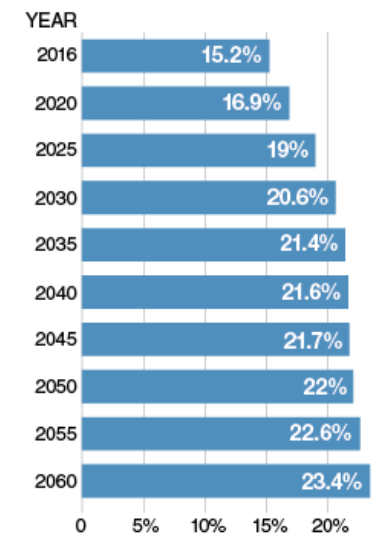
**Percentage-point change**

- -4 or less
- -3.99 to -2
- -1.99 to 0
- 0.01 to 2
- 2.01 to 4
- 4.01 to 6
- More than 6

	2012	2017	%-point change
<b>Greatest increase*</b>			
Ⓐ Alpine County, Calif.	12.3%	27.5%	+15.2
<b>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



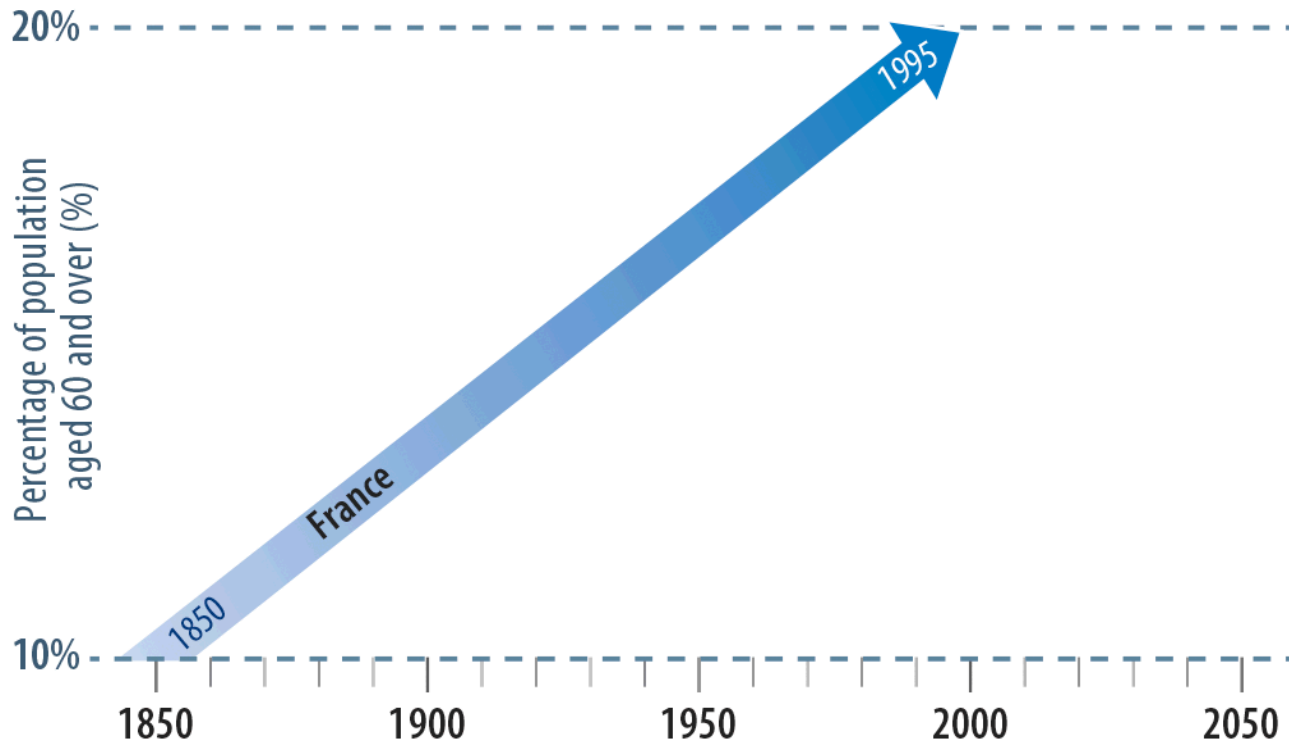
Percentage aged  
60 years or older:

- 30% or more
- 10 to <30%
- <10%

# 2015

# Speed of population ageing

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



# Current American Development Paradigm

“meet the perceived needs of  
families with children”



## Impact

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

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

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**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”



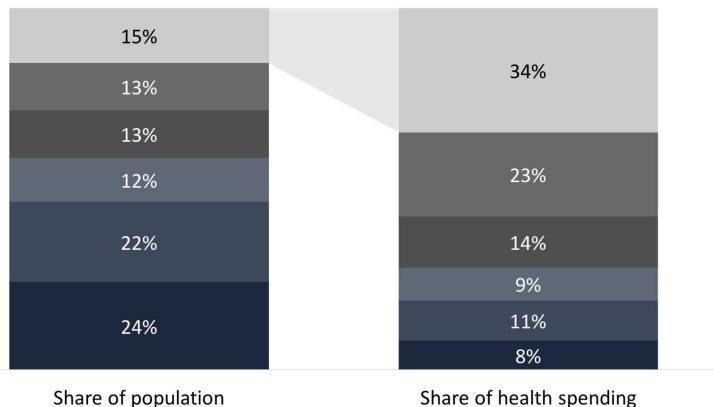
# Impact

All systems and arenas:

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

## US Seniors Account For The Largest Portion Of Healthcare Spending

■ Under 19 ■ 19 to 34 ■ 35 to 44 ■ 45 to 54 ■ 55 to 64 ■ 65 and above



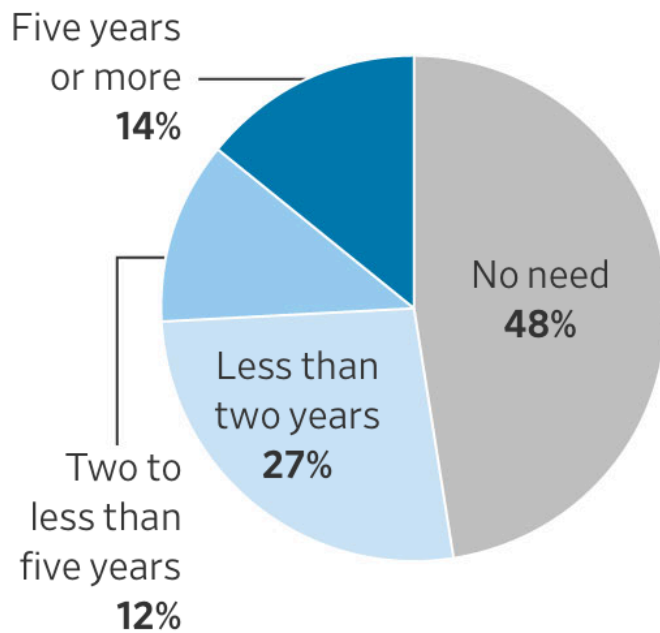
1. Total national health expenditures are \$4 billion today and \$5 billion by 2025 – US Census Bureau & CMS
2. National health expenditures as a percentage of GDP hit more than 15% in 2016, and that figure will climb to 19.4% of GDP (approximately \$6 trillion) in 2027 - CMS

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

## Long-Term Problems

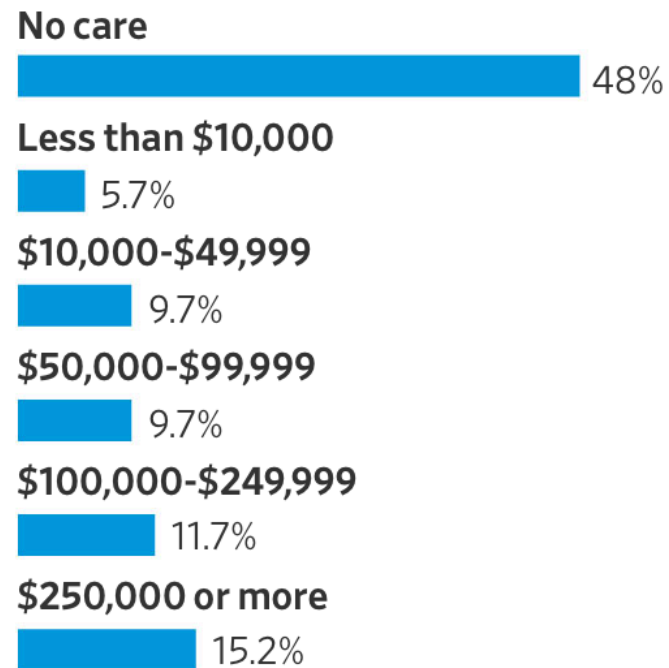
More than half of U.S. adults at least 65 years old are projected to need nursing-home or other care services...

### Length of care needed\*



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

### Projected spending on needed care



...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

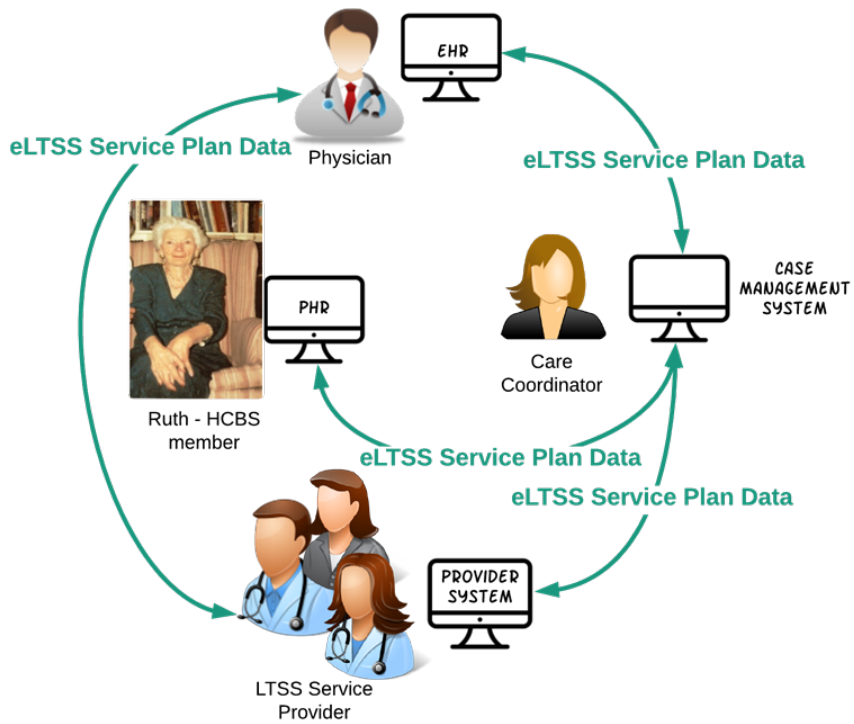


# Long Term Care, Technology & Data

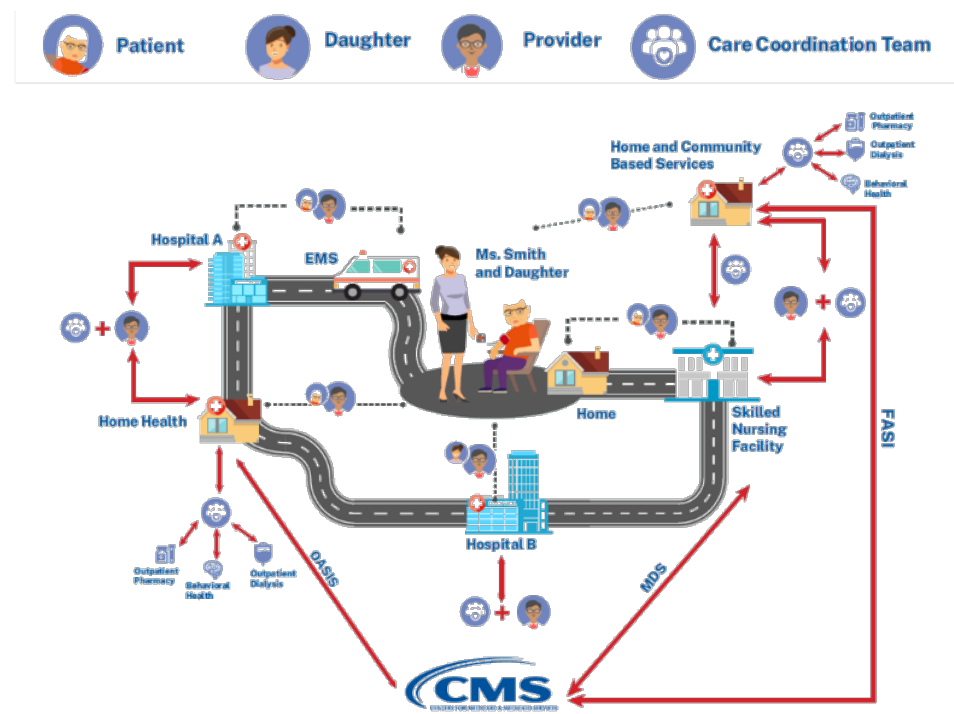
## “Limited adoption and use of Health Information Technology and quality measurement”

- 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.

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



# 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 SDH 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 of four elderly men sitting on a white wooden bench, viewed from behind. They are looking out over a vast blue ocean under a bright blue sky with scattered white clouds. The men are dressed in casual, comfortable clothing. The overall mood is peaceful and contemplative.

Thank You

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