

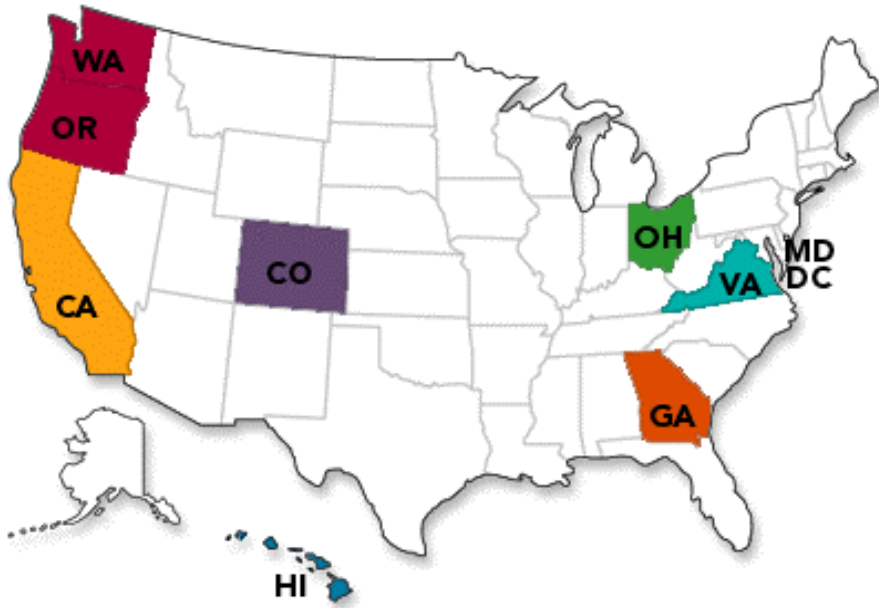
Implementing the DxCG Likelihood of Hospitalization Model in Kaiser Permanente

Leslee J Budge, MBA
leslee.budge@kp.org



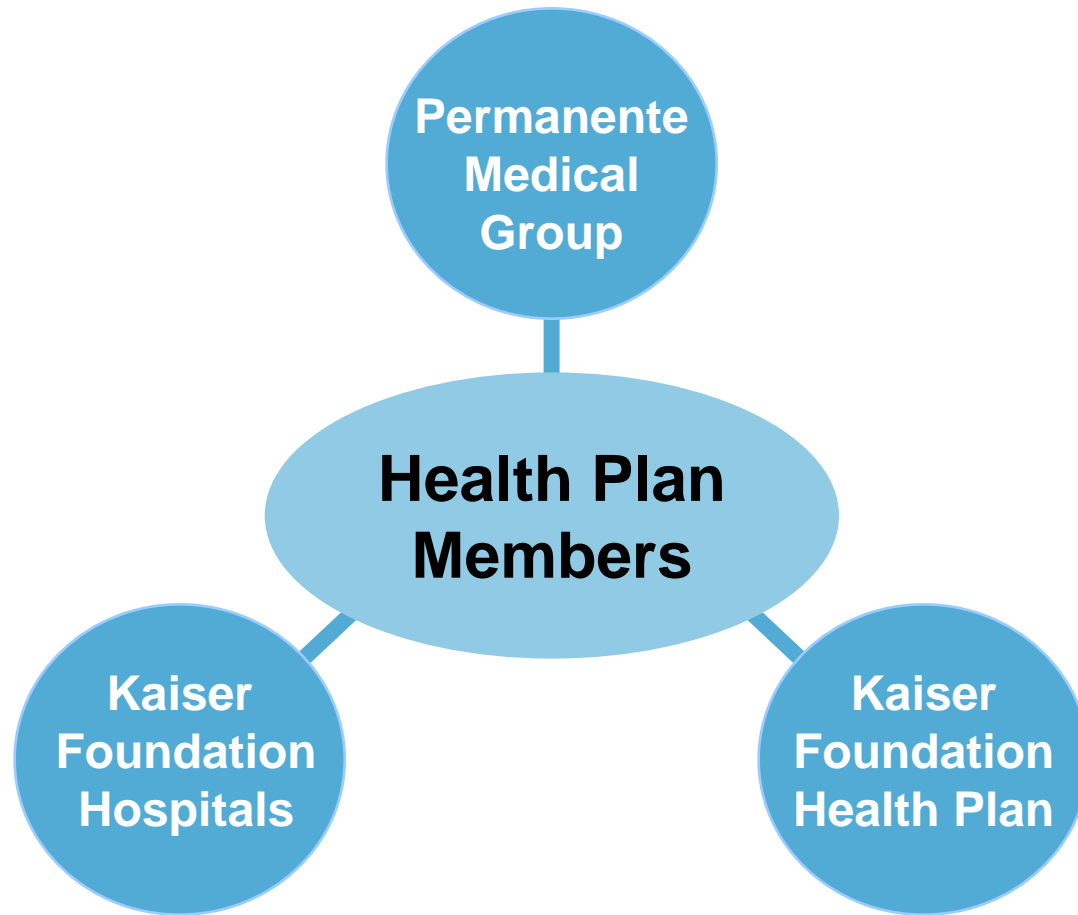
**KAISER
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Kaiser Permanente is the largest non-profit health care program in the United States



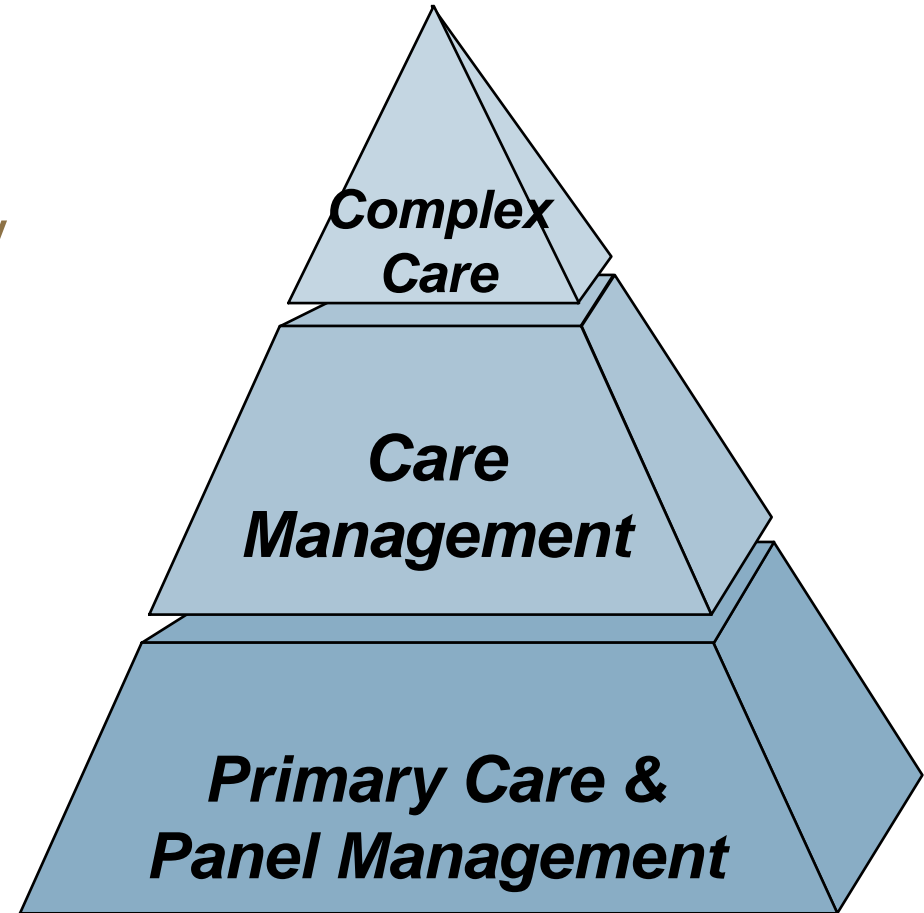
- 8.5 million members
- 8 regions in 9 states and D.C.
- 30 hospitals
- 431 medical offices
- 13,000 physicians
- 150,000 employees
- \$35 billion in revenue

Kaiser Permanente is an integrated care delivery organization with aligned quality-based incentives



We have multiple approaches for providing care to our member, whether they have a chronic illness or are healthy

- Program-wide electronic health record
- Electronic registries to identify members with chronic conditions
- Programs for members who need complex care
- Programs for members with chronic conditions
- Primary care physician care supported by a healthcare team



We identify members for specialized programs using rules-based methodologies

Because of our integrated structure and rapid access to clinical information, we have relied on utilization or laboratory results for member selection

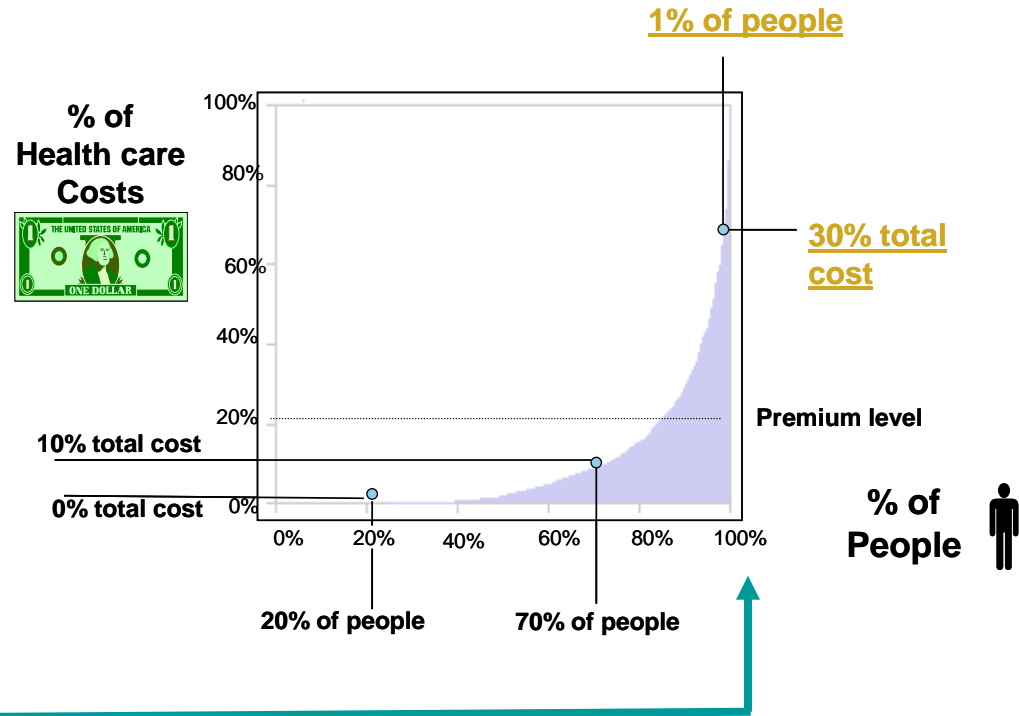
Age Group-Specific Scoring System

Risk Factors	If in this Age Group:		
	Under 65	65 to 84	85 Plus
	Sum these risk factor points:		
Age 45-54	2		
Age 55-64	3		
Age 75-84		3	
Male		2	2
CHF	6	10	3
Diabetes	5	6	2
Smoker	4	5	0
Recent AMI	7	11	6
Max Score (Sum of All Points)	27	37	13

We believed we could do a better job at targeting members for specialized programs

The aim of KP's predictive modeling pilot is to determine the effectiveness of predictive modeling to identify members at future risk for:

- utilization
- poor health outcomes
- cost



KP Southern California used the LOH in one medical center to select members for their CCM* program

What they found:

- Comparing two DxCG models: LOH and DCG Prospective
- Members on LOH list are older, sicker, and more are at end-of-life.
- 25 patients of the 200 had died in the first month, prior to intervention
- 25 of the patients were on both high-risk lists
- 118 of the 200 were appropriate for the active CCM program



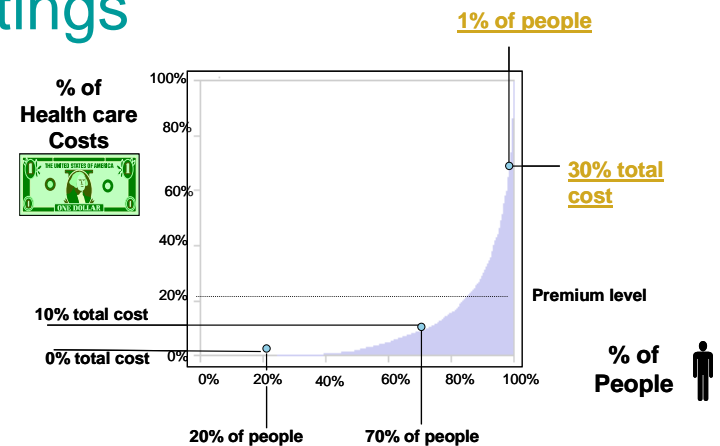
****Chronic Conditions Management***

KP Ohio region is using the LOH to identify members for their Advanced Care Panel pilot

Advanced Care Panel:

100-200 “Resource Intensive Members” are being assigned to a physician and health care team. The care process includes:

- Transition between care settings
- Enhanced ease of access
- Supportive end-of-life care



Members selected for Ohio's Advanced Care Panel

Selecting members for the advance care panel

- Produced the LOH scores for the top 1% of 140,100 commercial members
 - Filtered list to exclude diagnosis groups of cancer, neonates, trauma, end stage renal disease, and schizophrenia
 - 122 of the 458 remaining members had either diabetes, HF or both and met the initial criteria for ***Advanced Care Panel***
- LOH score for this group ranged from 0.879 to 0.167
 - Baseline costs ranged from \$12K to \$165K

Ohio's reaction to the LOH results has been favorable, in fact they were surprised a model could be so 'good'

- **The physicians reviewed charts of the first 68 members and found they were good candidates for the program**
- **In the first group of eligible members reached**
 - ***53% said yes to participation***
- **Reasons for non-participation**
 - Need to think about it
 - Not sure about program
 - Do not want to leave PCP

Understand predictive modeling

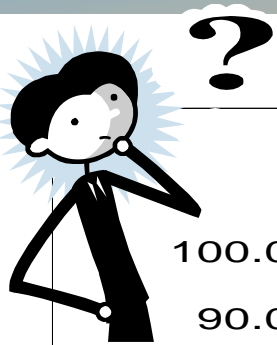
Dr. Smith reported that one of the patients identified reported no hospitalizations or ED visits recently but still was on the top 1% list.

How did he get on the top 1% list?

By-the-way--- he has many comorbidities.

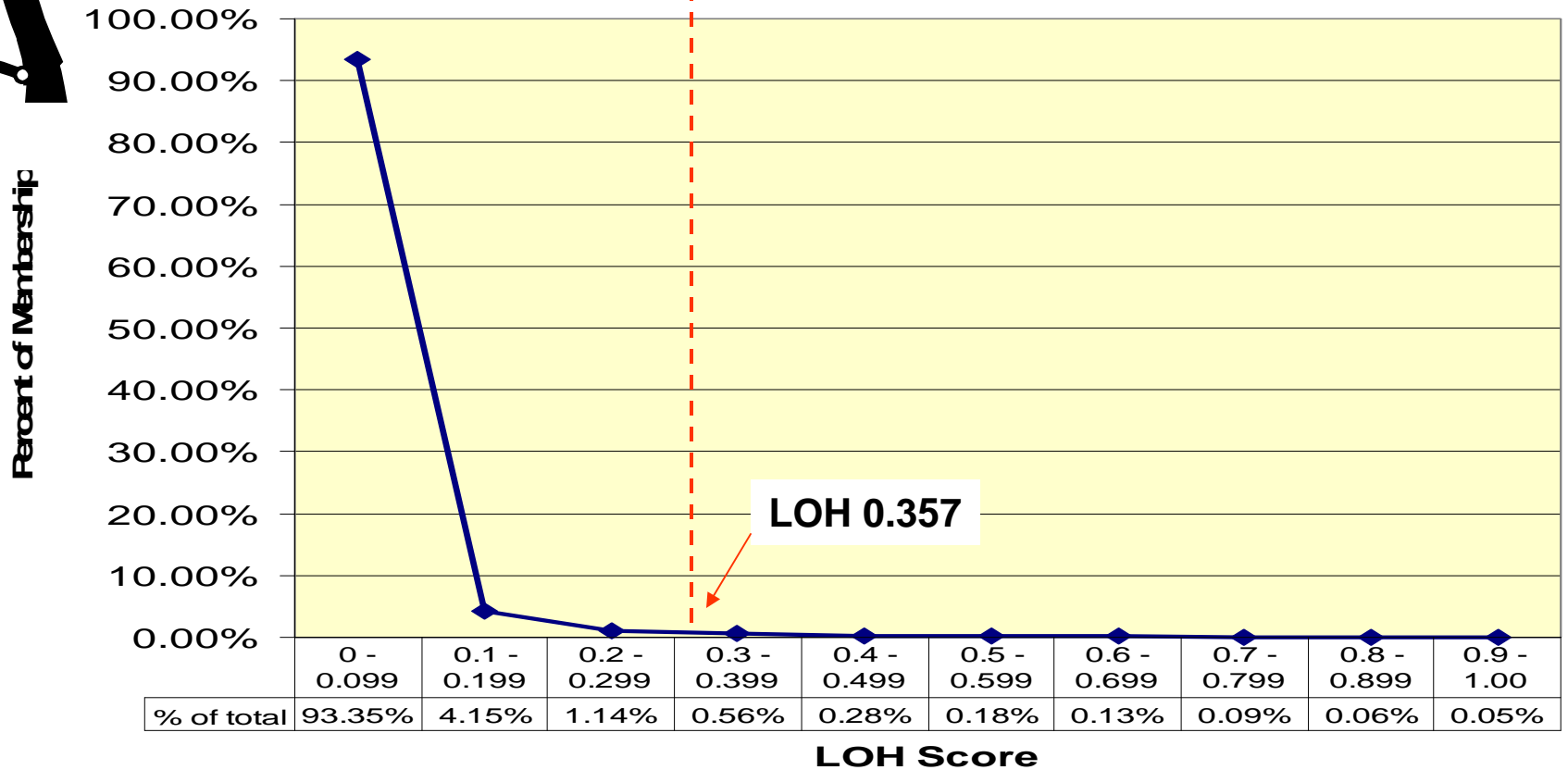


The member's score is only 0.4—why is she in the top 1%?

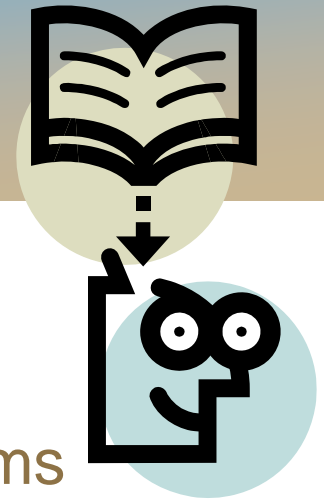


Top 1%

LOH Distribution in OH total Membership



What have we learned?



- First, to accept predictive modeling our physicians need to ‘see’ that it is an effective tool for selecting member for specialized programs
- Second, the challenge is not running the model but getting the results into the hands of the people who will enroll members in the program
- We have struggled with the questions of:
 - What do you want to predict?
 - What are you going to do with the results?
- The Resource Intensive Member program has helped us answer these two questions

Ongoing evaluation: Searching for evidence of impactability...



Our hypothesis: specific care in the 6 months prior to a predicted hospitalization will help to avoid the hospitalization

Assumption: hospitalization for members with left ventricular systolic dysfunction is a function of

- Physician visits
- Use of evidence-based medications

Defining the study and control groups

- 1822 NW region members in the top 1% with a diagnosis of heart failure in the evaluation period
- Study population: members with a heart failure HCC who were hospitalized at least once for any reason in the evaluation period (N = 1468)
- Control population: members with a heart failure HCC who were NOT hospitalized during the same time period (N = 354)

Data to evaluate Impactability

In the 6 months prior to the predicted hospitalization collect the following data:

- Number of PCP visits
- Number of specialty care visits
- Number of hospital admissions
- Number of ED visits
- Ejection fraction value
- Rx for beta-blocker (yes/no)
- Rx for ACE-I or ARB (yes/no)
- Rx for spironolactone (yes/no)

Results of evaluation for impactability...

Work in process



Questions