

# Heart Failure - Large Market Opportunities for New Biomarkers

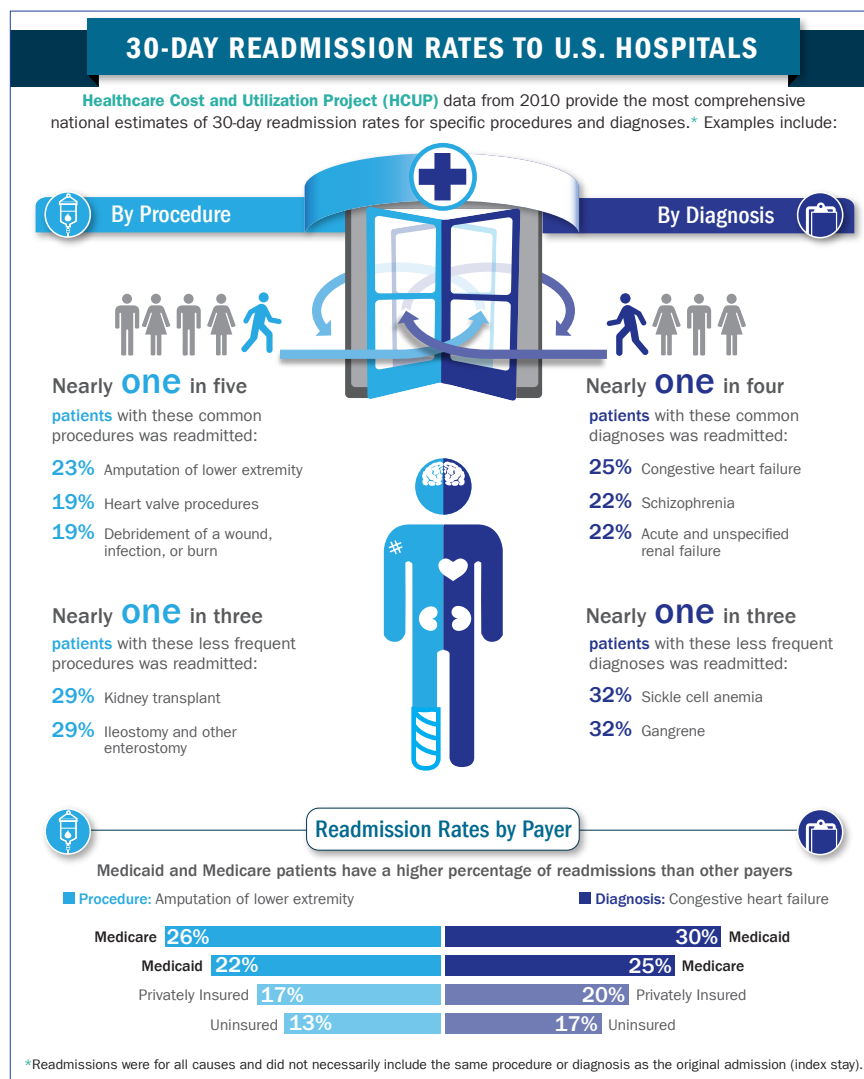
Integration of Market and Clinical  
Research

Previously Presented Publicly  
Predominantly in 2011

# Heart Failure Patient Statistics Show Large Unmet Need

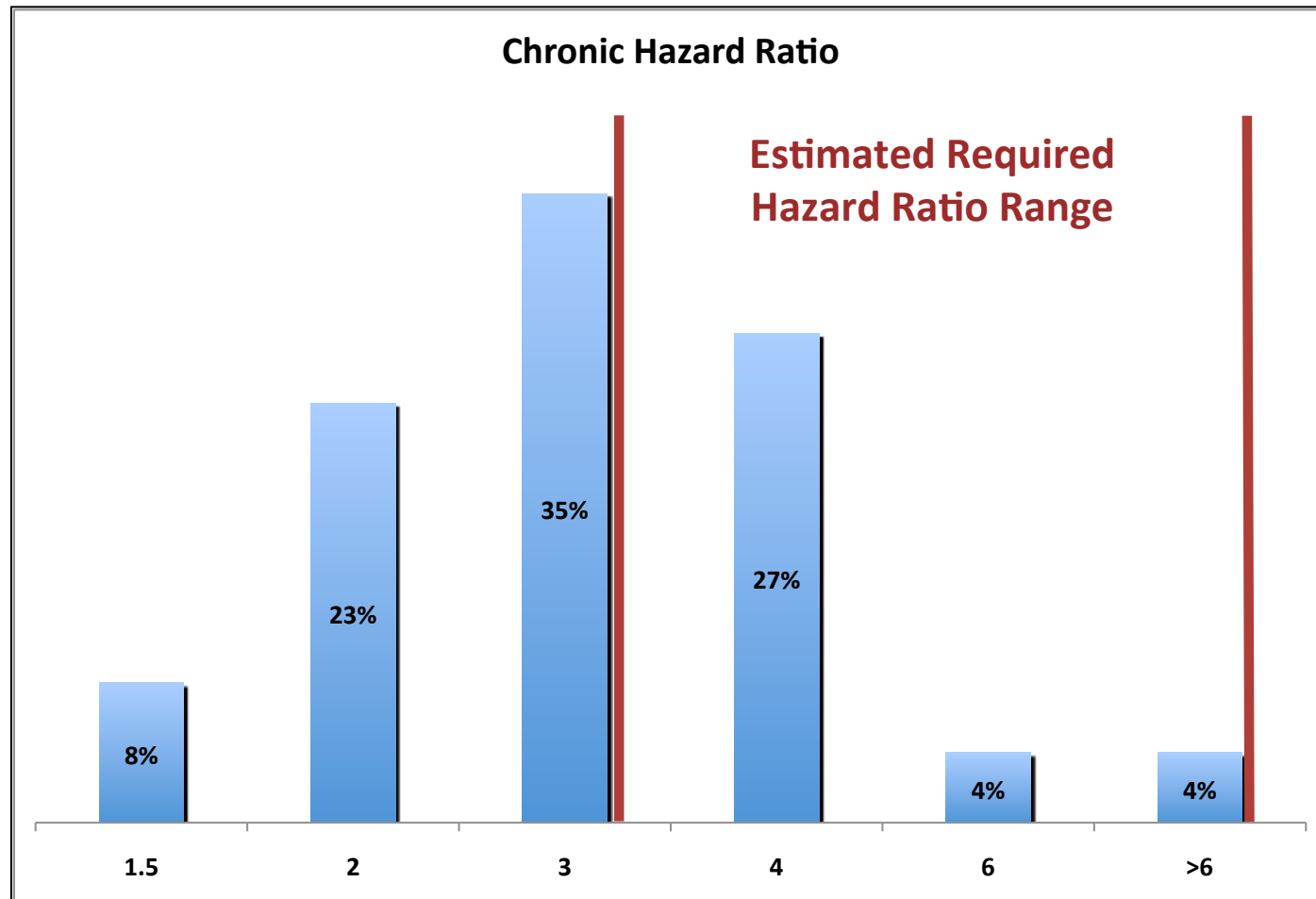
- **Worst** diagnosis for 30-day hospital readmission
- **6 million** patients in US have HF
- **650 thousand** new HF patients per year
- **6.5 million** hospital days annually due primarily to HF
- **14 million** office visits per year due to primarily to HF
- **1.3 million** hospitalizations per year have HF as a primary diagnosis
- **3 million** hospitalizations per year have HF as a primary or secondary diagnosis

# HF has More Readmissions than Other Major Diagnoses or Procedures

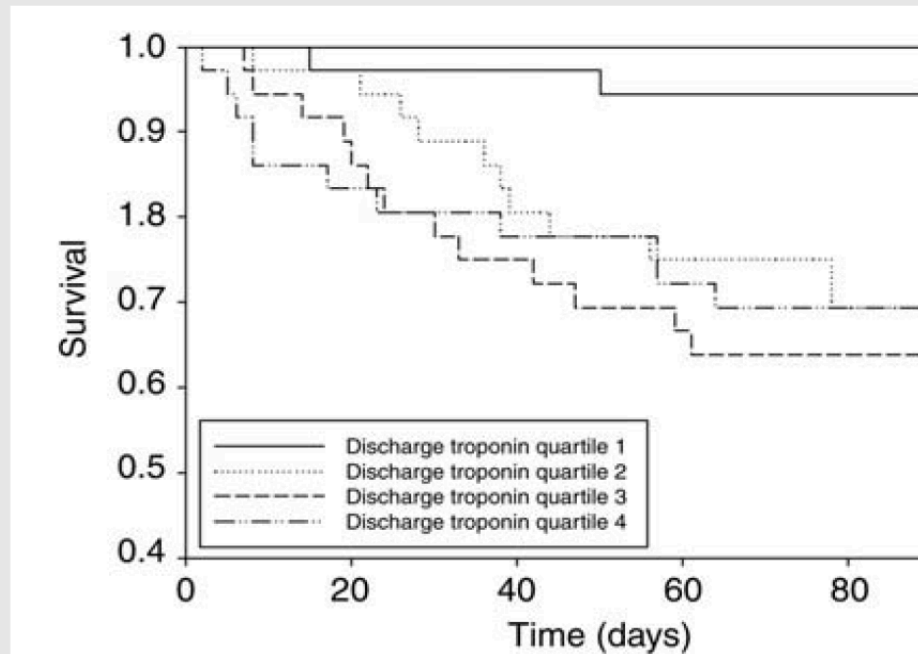


Source: HCUP Statistical Briefs #153 and #154:  
<http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp>

# Hazard Ratio of 3 or Greater Required by MDs to Use a Particular Assay



# Clinical Study Showed a Biomarker Able to Differentiate HF Risk Cohorts



**Figure 2** Events by discharge troponin i quartiles. Patients in quartiles 2–4 had significantly increased rate of mortality and heart failure-related readmissions than quartile 1. Quartile 1: 0.7–13.7 ng/L, Quartile 2: 13.7–29.5 ng/L, Quartile 3: 29.5–87.6 ng/L, Quartile 4: 87.6 ng/L  $\geq$  1000 ng/L.

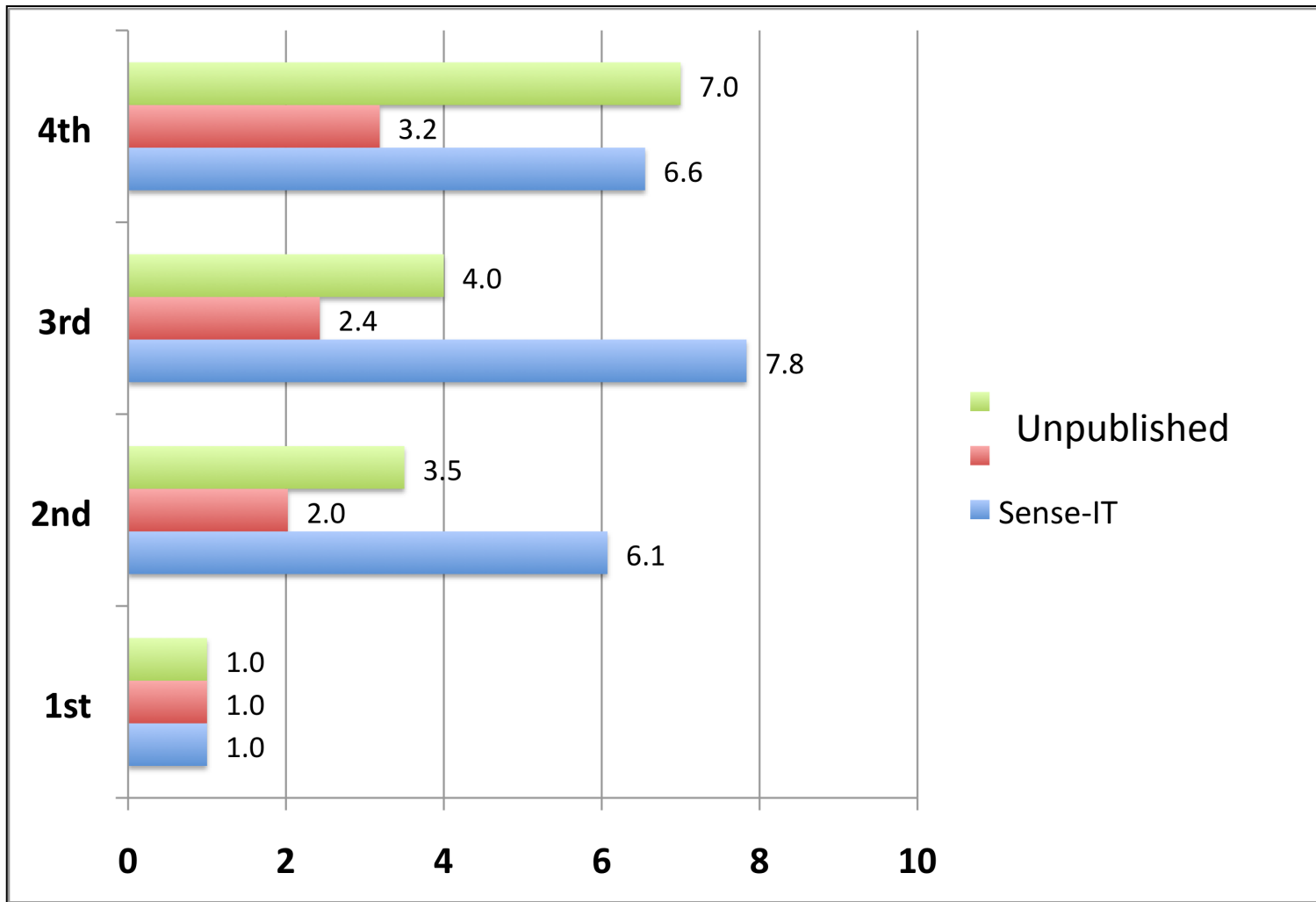
## Clinical Research

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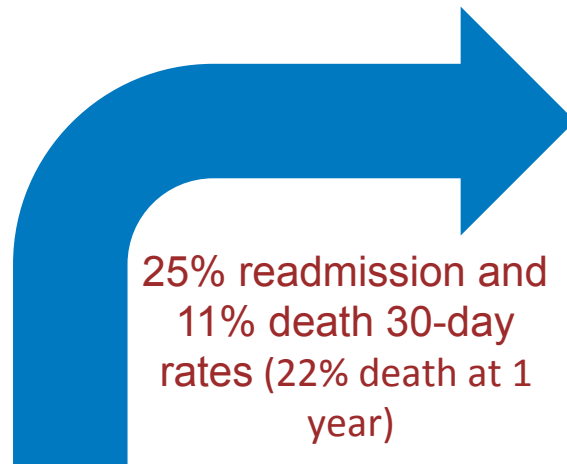
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“Serial changes in high-sensitive troponin I predict outcome in patients with decompensated heart failure,” *European Journal of Heart Failure* (2010) 13, 37–42

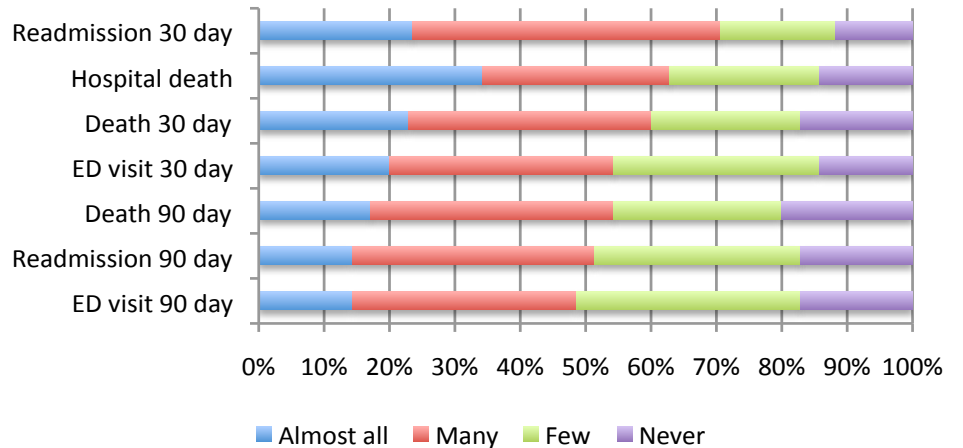
# Sufficient Hazard Ratios also Achieved



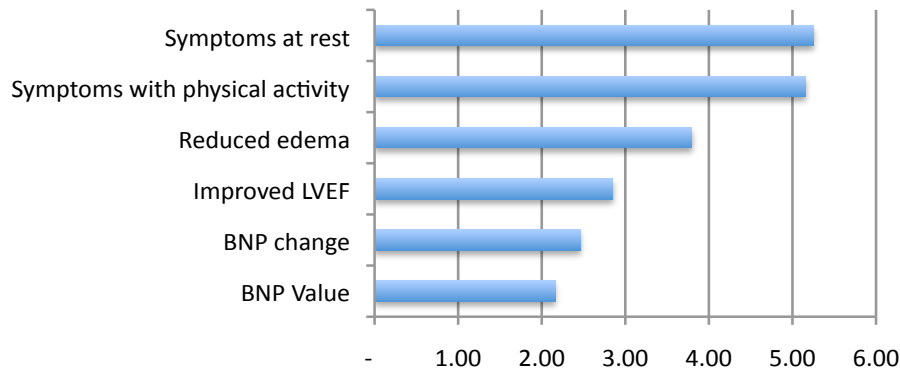
# Discharge of HF Needs an Objective Measurement, and MDs seem Willing to Move to a Sufficiently Better Biomarker



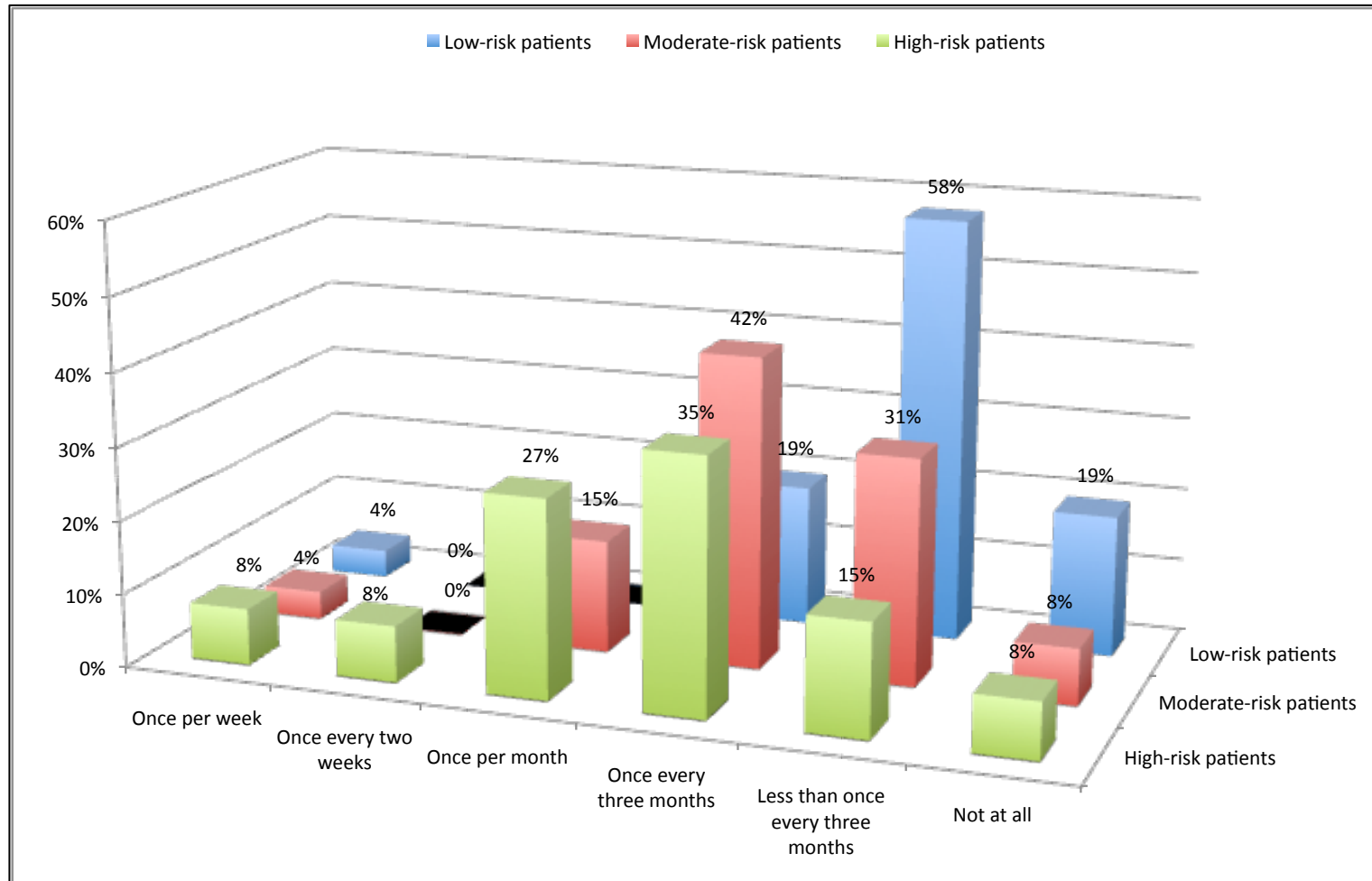
## How Often Would Use Biomarker



## Rank of Most Used Screen to Discharge



# Frequency of Testing High for Biomarkers that MDs Would Use



# Given the Patient Statistics, Potential Market for a New Biomarker in HF also Quite High

		Once per week	Once every two weeks	Once per month	Once every three months	Less than once every three months	Not at all	
	Low-risk patients	4%	0%	0%	19%	58%	19%	100%
	Moderate-risk patients	4%	0%	15%	42%	31%	8%	100%
	High-risk patients	8%	8%	27%	35%	15%	8%	100%
		5%	3%	14%	32%	35%	12%	100%
<b>Total patients</b>	<b>6,000,000</b>	307,692	153,846	846,154	1,923,077	2,076,923	692,308	
<b>Out-patient tests</b>		16,000,000	4,000,000	10,153,846	7,692,308	4,153,846	0	<b>42,000,000</b>
<b>In-patient days</b>	<b>6,500,000</b>							
<b>In-patient tests</b>								<b>6,500,000</b>
<b>Total tests</b>								<b>48,500,000</b>
<b>Out-patient visits</b>	<b>14,500,000</b>							
<b>Out-patient tests</b>								<b>14,500,000</b>
<b>Alternative total tests</b>								<b>21,000,000</b>

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