



The Value of Healthcare Information Exchange and Interoperability

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Eric Pan, MD, MSc

Associate Director of Fellowship

Center for Information Technology Leadership

Instructor in Medicine

Brigham and Women's Hospital & Harvard Medical School

Boston, Massachusetts, USA



CITL Mission

- Produce timely, rigorous, market-driven assessments which:
 - Help providers invest wisely
 - Help IT firms understand the value proposition
 - Help public shape health policy
- *“How do we assess the array of IT options in healthcare, and determine the benefits they bring to patient care and the bottom line?”*

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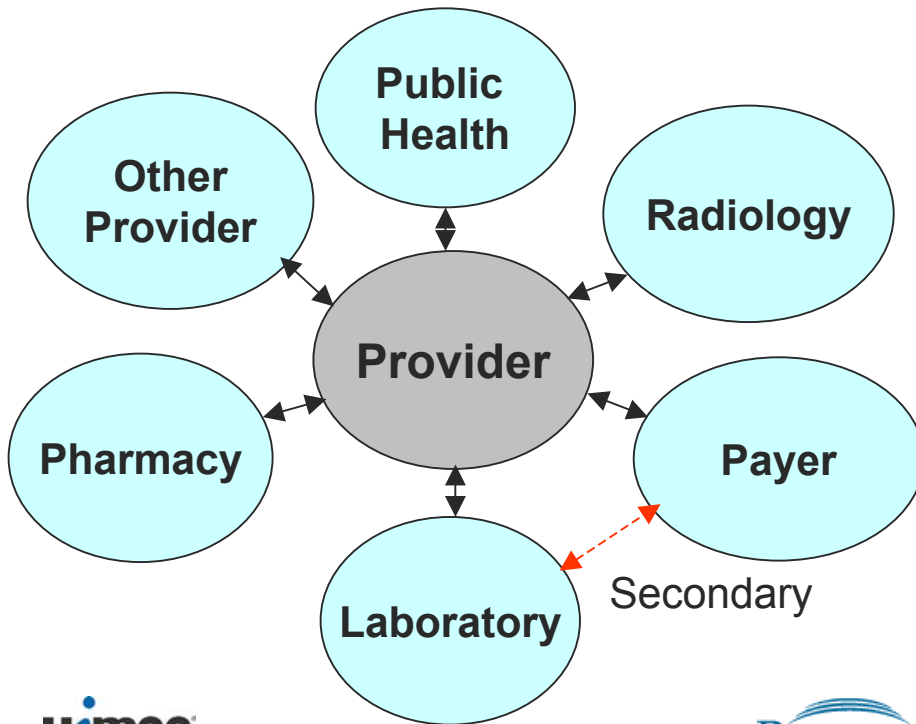
- Cap Gemini Ernst & Young
- Eclipsys
- IDX
- Intersystems
- Misys
- Siemens

Today's Agenda

- What are the approaches to Healthcare Information Exchange and Interoperability (HIEI)?
- What would HIEI cost?
- What would be its benefits?
- What is its bottom line value?

Scope of HIEI Assessment

- US health care system is too complex to model. CITL focused on data from doctor-patient encounter:



Providers (hospitals, outpatient offices) & common care partners
Includes clinical & administrative data

Excluded:
Secondary transactions
Transactions within organizations (Internal Integration)

Analytic Approach

- Literature review
 - > 600 citations reviewed: academic, general
 - Evidence of clinical, financial, organizational value
- Expert panel
 - Leaders of local data sharing initiatives, transaction experts
 - General approach & review, estimated HIEI impact
- Cost-benefit software model

HIEI Expert Panelists

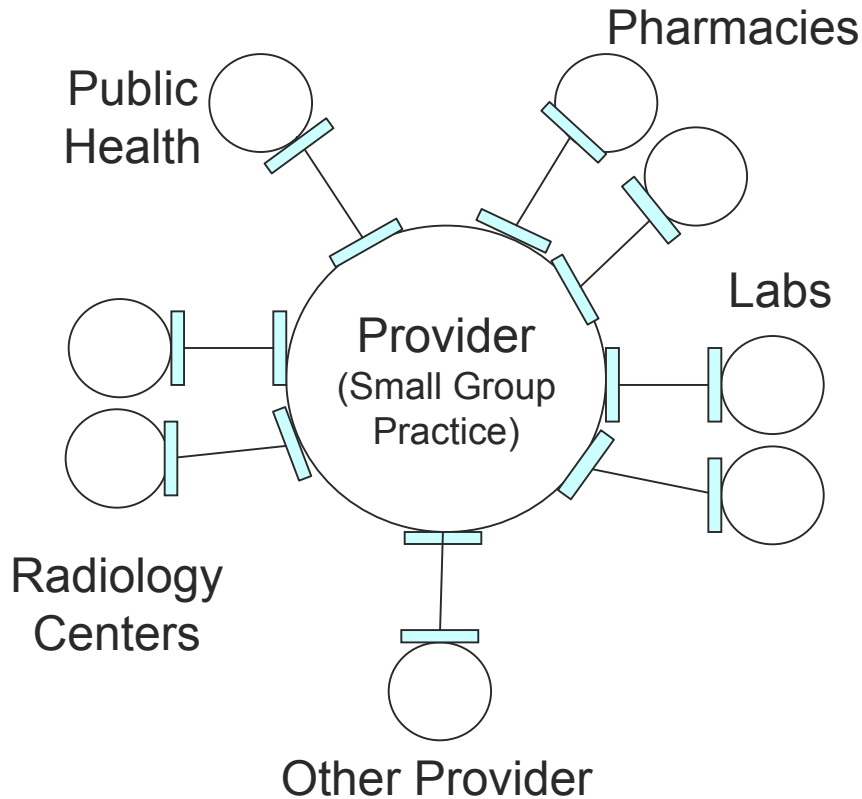
- **David Brailer, MD, PhD**
 - Santa Barbara County Care Data Exchange, Health Technology Center
- **William Braithwaite, MD, PhD**
 - Independent consultant, “Dr HIPAA”
- **Paul Carpenter, MD**
 - Associate Professor of Medicine, Endocrinology-Metabolism and Health Informatics Research, Mayo Clinic
- **Daniel Friedman, PhD**
 - Independent public health consultant
- **Robert Miller, PhD**
 - Associate Professor of Health Economics, UCSF
- **Arnold Milstein, MD, MPH**
 - Pacific Business Group on Health, Mercer Consulting, Leapfrog Group
- **J Marc Overhage, MD, PhD**
 - Regenstrief Institute, Associate Professor of Medicine, Indiana University
- **Scott Young, MD**
 - Senior Clinical Advisor, Office of Clinical Standards and Quality, CMS
- **Kepa Zubeldia, MD**
 - President and CEO, Claredi Corporation

HIEI Taxonomy

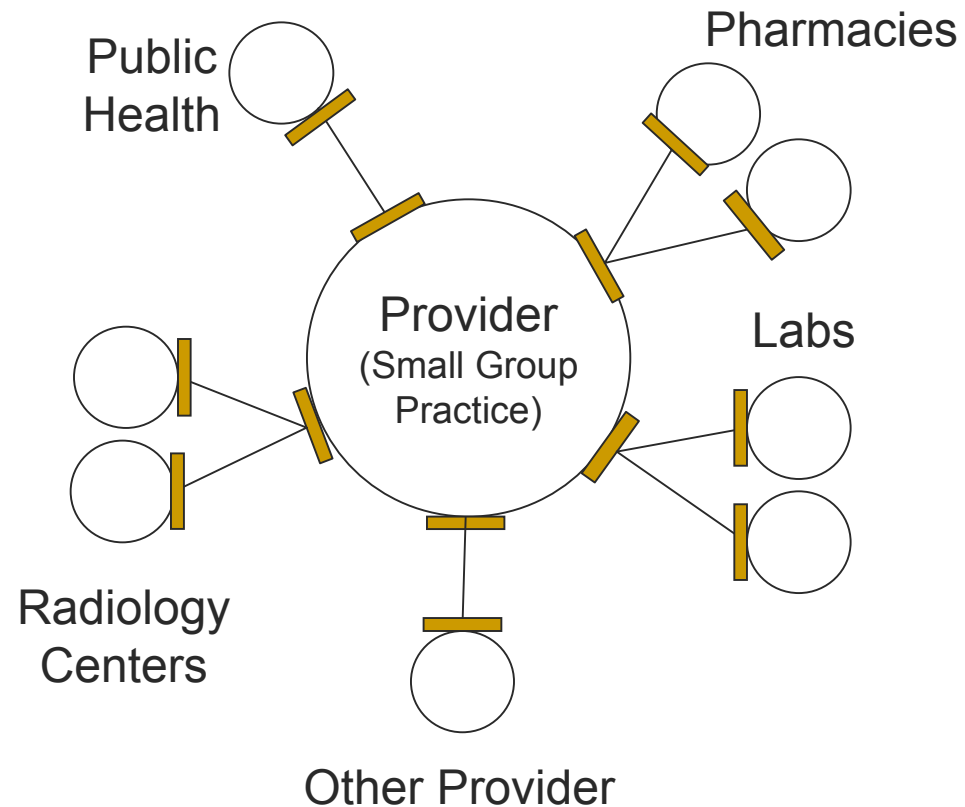
Level	Description	Examples
1	Non-electronic data	No PC/information technology
2	Machine-transportable data	Fax/Email
3	Machine-organizable data	Structured messages, non-standard content/data
4	Machine-interpretable data	Structured messages, standardized content/data

How Many Interfaces?

Level 3



Level 4

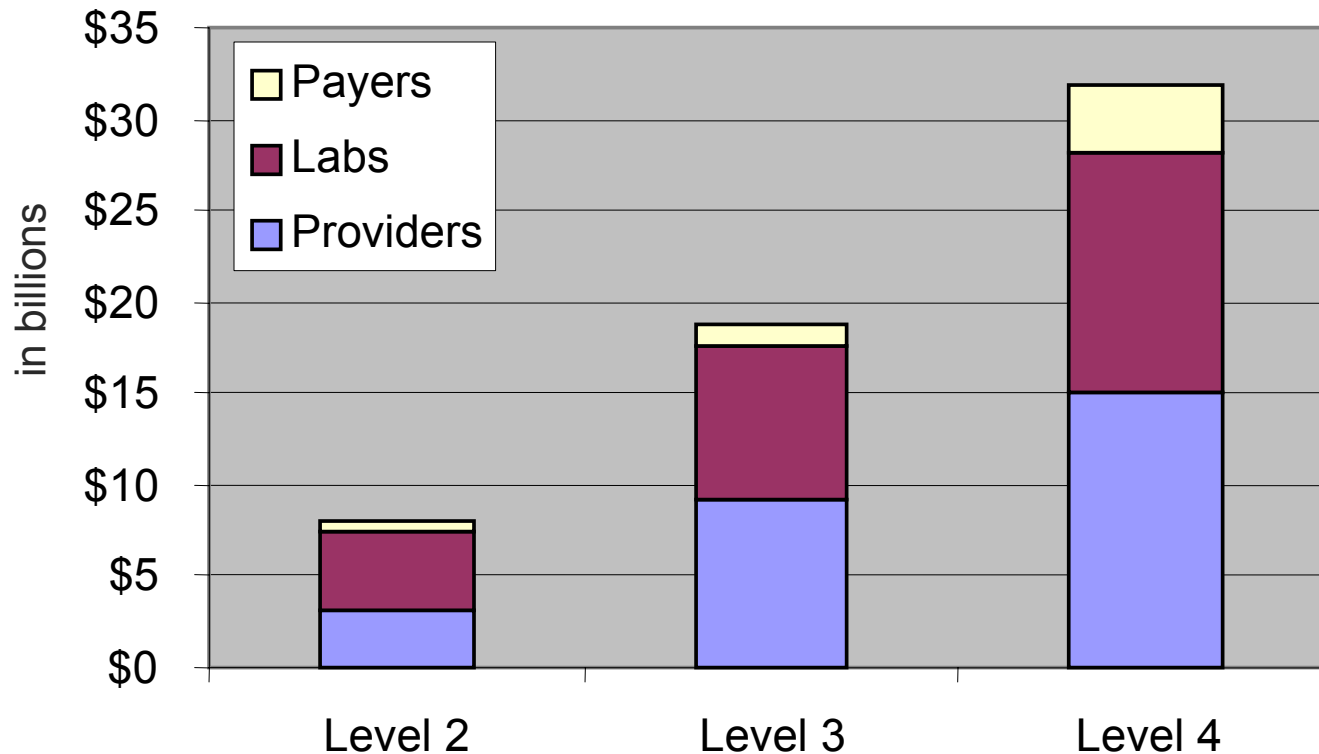


Provider-Lab HIEI

- Benefits
 - Improve clinician access to longitudinal test results
 - Eliminate errors from reporting results verbally
 - Make cost information available, optimize ordering
 - Improve convenience for patients
 - Reduce redundant tests
 - Save time ordering tests, sending and receiving results

- Evidence re current rate of redundancy, time cost
 - Experts estimated HIEI impact

Provider-Lab Annual Benefit



13.6% from avoided tests
86.4% from time savings
\$31.8B national benefit at Level 4
\$118,000 per MD in free-standing office at Level 4

Provider–Radiology HIEI

Benefits

Improve patient safety and optimize ordering by giving radiologist access to relevant clinical information

Reduce errors of omission with automated reminders for follow-up studies

Reduce environmental impact

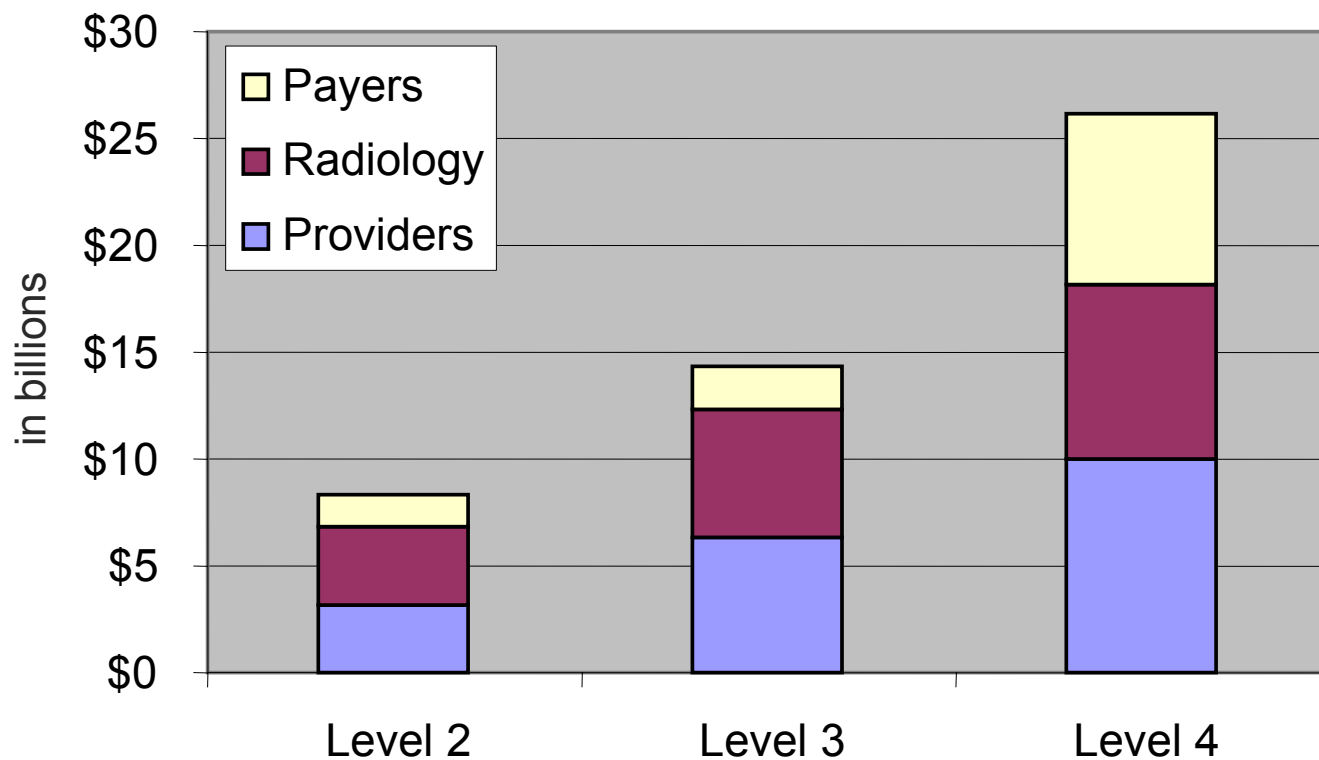
Reduce redundant tests

Save time ordering tests, sending and receiving results/images

Evidence re current rate of redundancy, time cost

Experts estimated HIEI impact

Provider–Radiology Annual Benefit



35% from avoided tests

65% from saved time

\$26B national benefit at Level 4

\$60,000 per MD in free-standing office at Level 4

Provider–Pharmacy HIEI

Benefits

Improve patient safety: access to complete medication lists will reduce drug interactions and adverse drug events

More convenient for clinicians: automatic refill alerts, access to adherence information, automated insurance forms, identify patients for drug recalls

Efficient formulary management between pharmacies and payers – probably biggest financial impact

Save time ordering, dispensing prescriptions

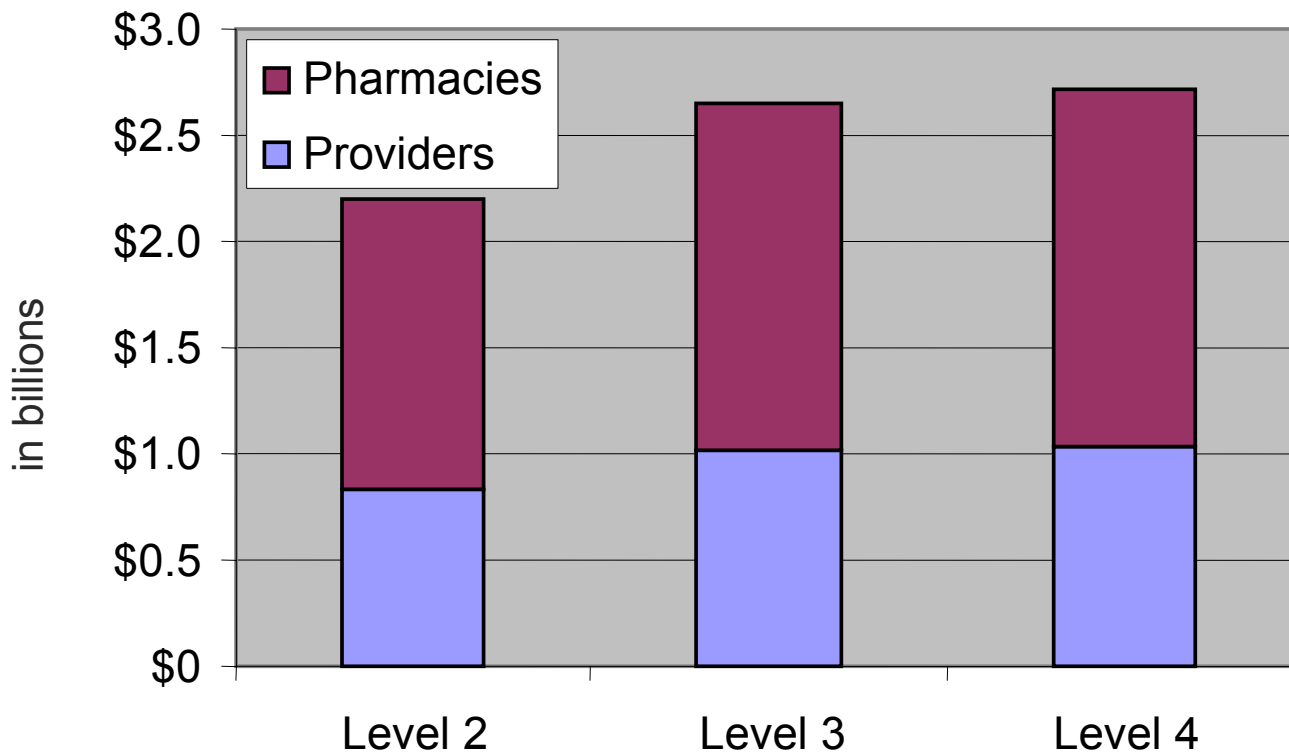
Evidence re time and phone calls:

55% of prescriptions involve a phone call

Each call = 2 provider minutes + 3 pharmacist minutes

Experts estimated HIEI impact on % calls

Provider-Pharmacy Annual Benefit



\$2.7B national benefit at Level 4

\$4,700 per MD in free-standing office at Level 4

Probably most benefit from pharmacy-payer HIEI

Provider-Provider HIEI

Benefits

- Reduce fragmentation

- Reduce educated guesses in clinical care

- Improve referral quality by making relevant information available to the consultant

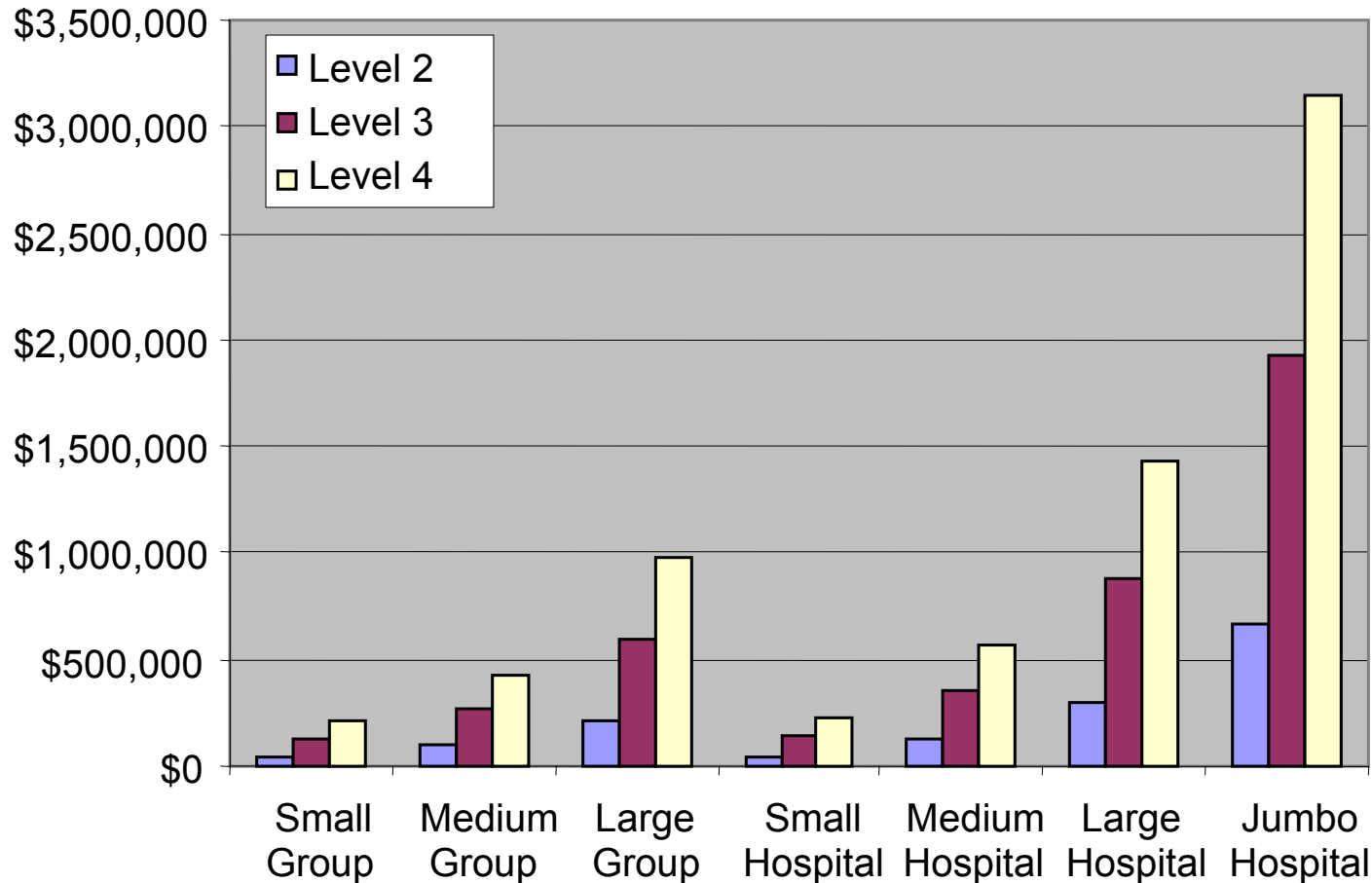
- Save time responding to referrals

- Save time responding to chart requests

Evidence re referral rates, % visits missing information, administrative costs of referrals and chart requests

- Experts estimated HIEI impact on administrative costs

Provider-Provider Annual Benefit



\$43,000 per office MD

National Benefit:

Level 2: **\$2.8 billion**

Level 3: **\$8.1 billion**

Level 4: **\$13.2 billion**

Provider–Public Health HIEI

Benefits

Earlier recognition of disease outbreaks

Biosurveillance: identify warning signs by aggregating data from many sources

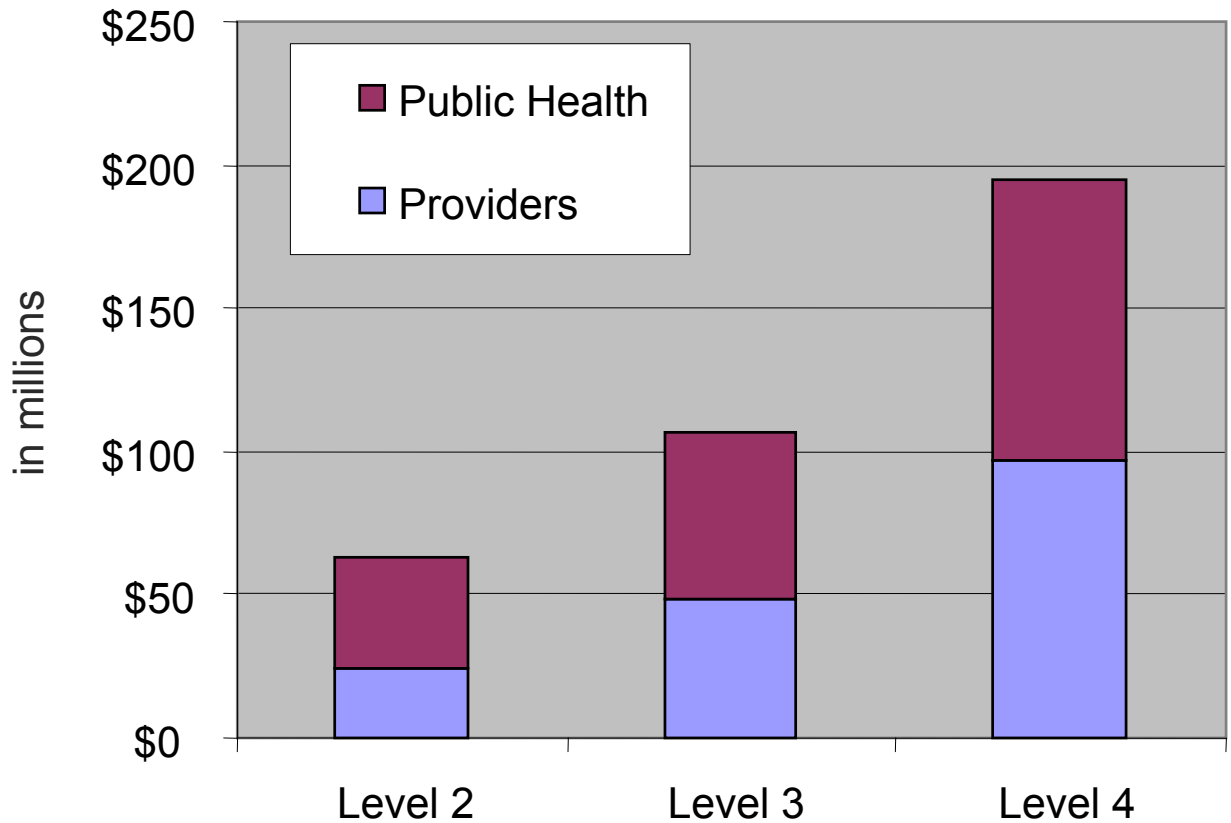
Increase % of disease reported

Save time reporting vital statistics and disease

Evidence re number of vital statistics and disease reports, and time required

Experts estimated HIEI impact

Provider–Public Health Annual Benefit



\$195 million national benefit

Provider-Payer HIEI

Benefits

- Save time

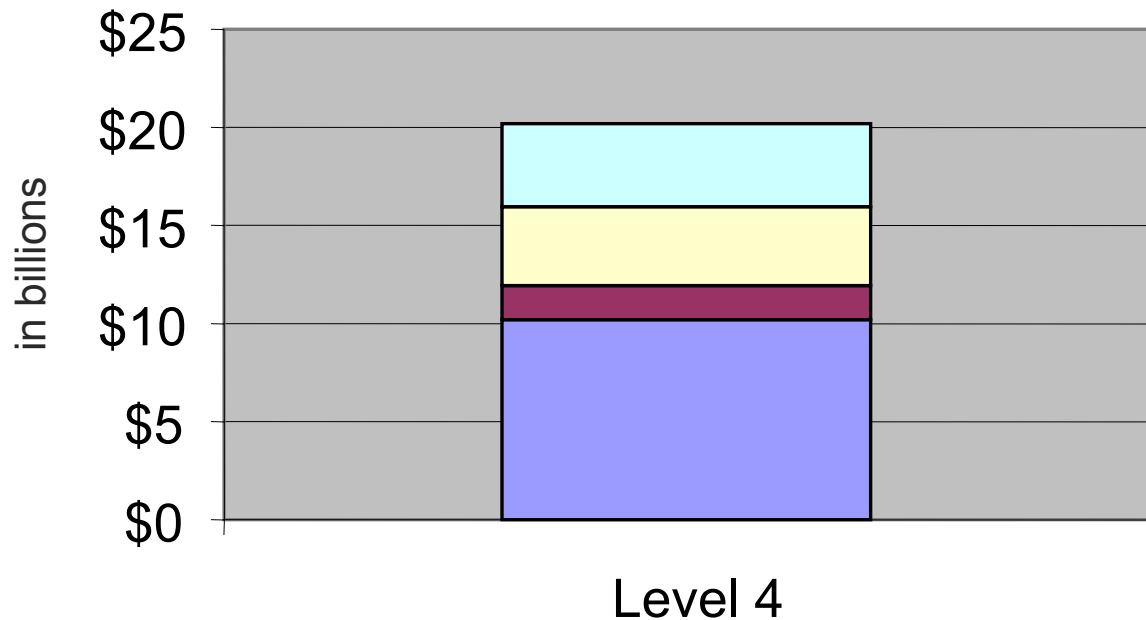
- Reduce rejected claims

Evidence re % of transactions already automated due to HIPAA

Calculated impact of full automation at Level 4

- Levels 2-3 not allowed by HIPAA

Provider-Payer Annual Benefit

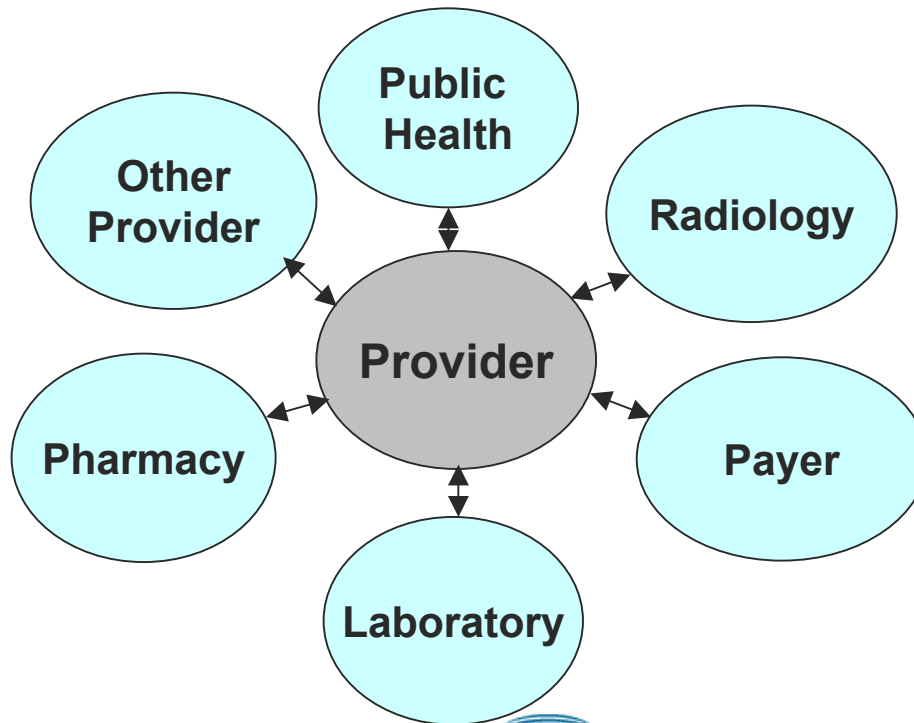


\$20.1B national net benefit
\$10.3B to providers
\$ 9.8B to payers

- Medicaid
- Medicare
- Commercial
- Providers

HIEI Cost Model

- Interfaces in each relationship
- Internal systems for providers



Other internal systems:

- Radiology, payers, laboratories, pharmacies already partially automated, hard to get proprietary cost data
- Complex public health system, no cost data available

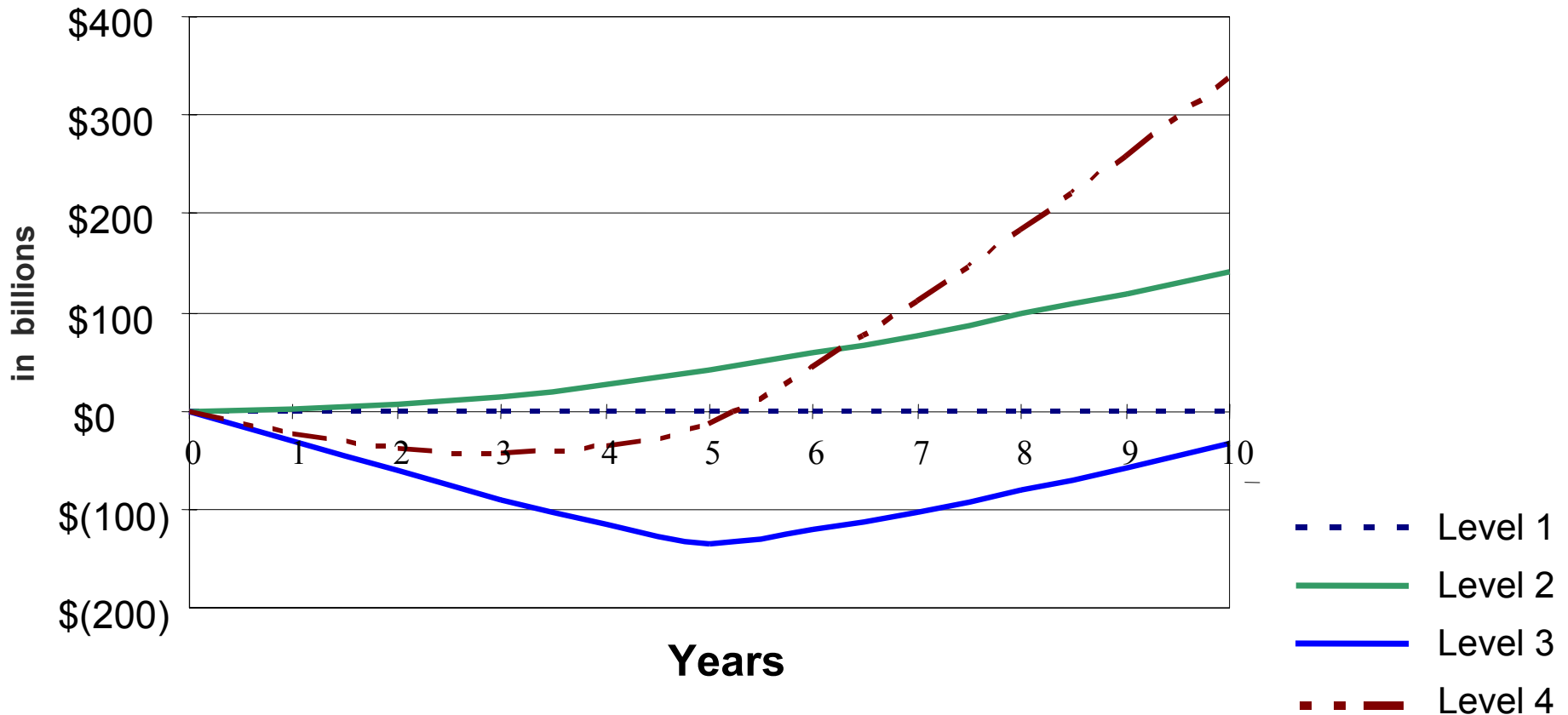
HIEI National Value

Value = Benefit - Cost

	<u>Value during 10-year Implementation</u>	<u>Value per year after Implementation</u>
Level 2	\$141 B	\$22 B
Level 3	-\$34 B	\$24 B
Level 4	\$337 B	\$78 B

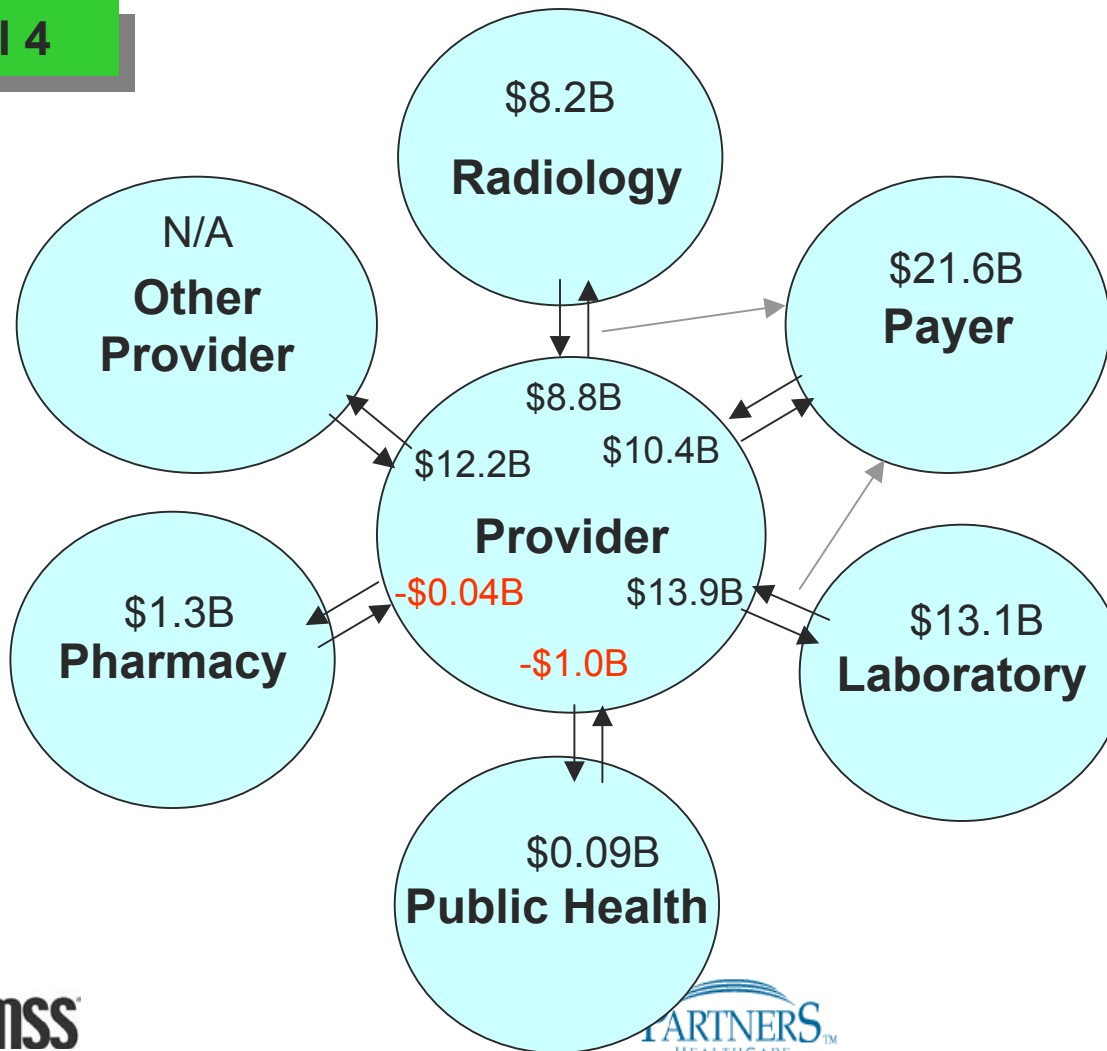
Value of HIE standards is the difference between Level 3 & 4

10-Year Cumulative Value



Steady-State Annual Value

Level 4



Total: \$78 billion

Providers: \$34 billion

Conclusions

- National implementation of HIEI is a good investment.
- Standardized Level 4 HIEI is by far the best investment for the nation and for individual providers, and probably for labs, radiology centers, payers, and the public health system
- Non-standardized HIEI is not a good investment.
 - Interfaces are expensive
 - We will have to do it twice
- We must set standards

Limitations

- Benefits are incomplete
 - No accounting for transactions beyond our scope
 - No evidence re clinical benefit
- Costs are incomplete
 - Could not account for costs of HIEI-capable systems in pharmacies, labs, radiology, public health
 - Interface, provider system costs may be inaccurate
 - Did not estimate cost of converting legacy data, workflow re-engineering
 - Did not estimate cost of developing standards essential for Level 4
- Time savings may be realized as quality improvements rather than financial returns

- “Unless interoperability is achieved, physicians will still defer IT investments, potential clinical and economic benefits won’t be realized, and we will not move closer to badly needed healthcare reform in the US.”
David Brailer, press conference May 21, 2004



Thank You!

Order report www.himss.org
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Eric Pan, MD, MSc
epan@citl.org



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HIEI Cost

	Level 3 Rollout	Level 4 Rollout	Level 3 Annual	Level 4 Annual
Office systems	\$162.9 B		\$9.1 B	
Hospital systems	\$27.1 B		\$1.6 B	
Office and hospital interfaces	\$123.9 B	\$75.7 B	\$9.0 B	\$5.4 B
Stakeholder interfaces	\$6.4 B	\$9.9 B	\$0.5 B	\$0.5 B
Total	\$320 B	\$276 B	\$20.2 B	\$16.5 B

HIEI Level 4 Value during Implementation

