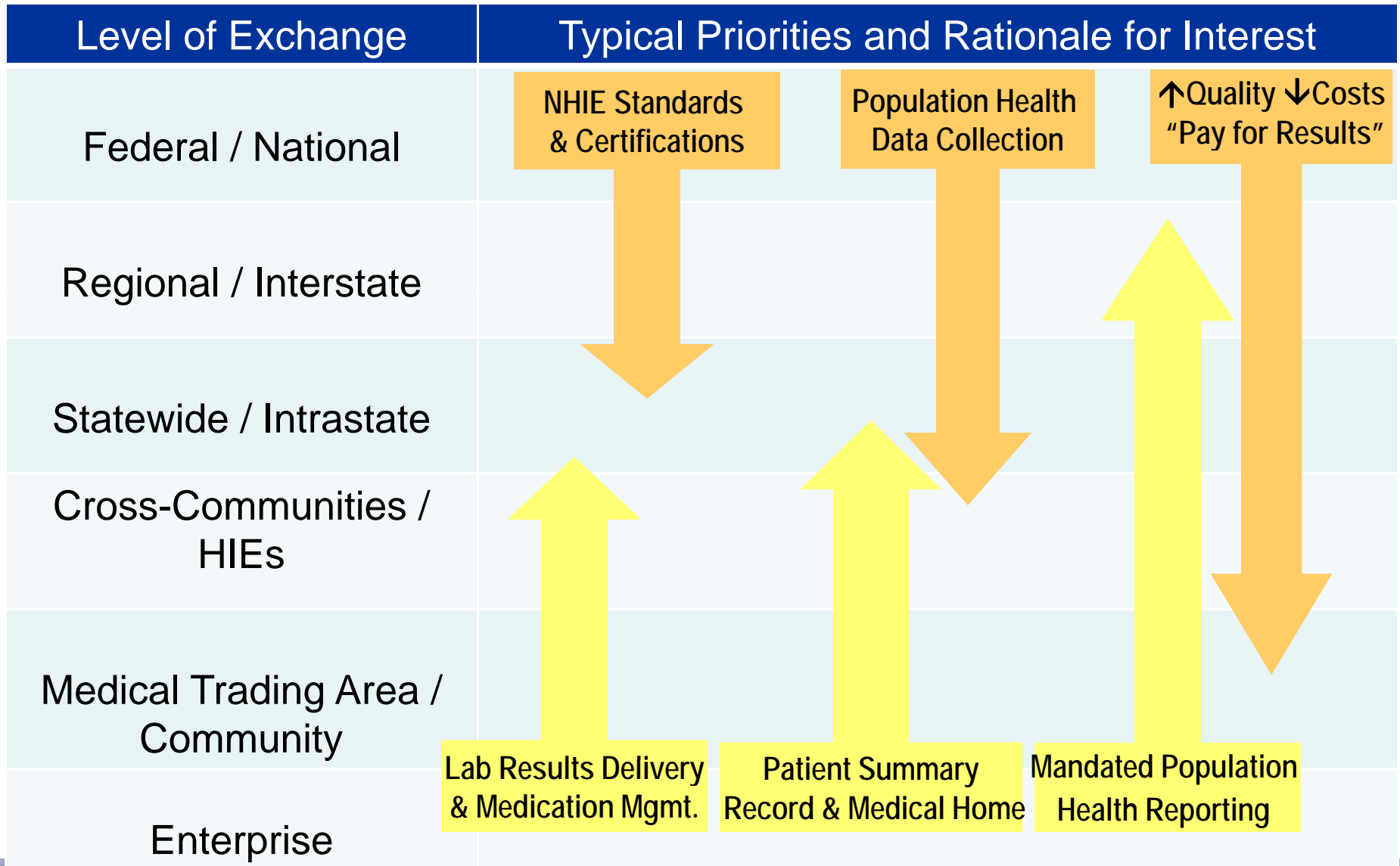


# NHIN Trial Implementation Business Plan (Internal DRAFT)

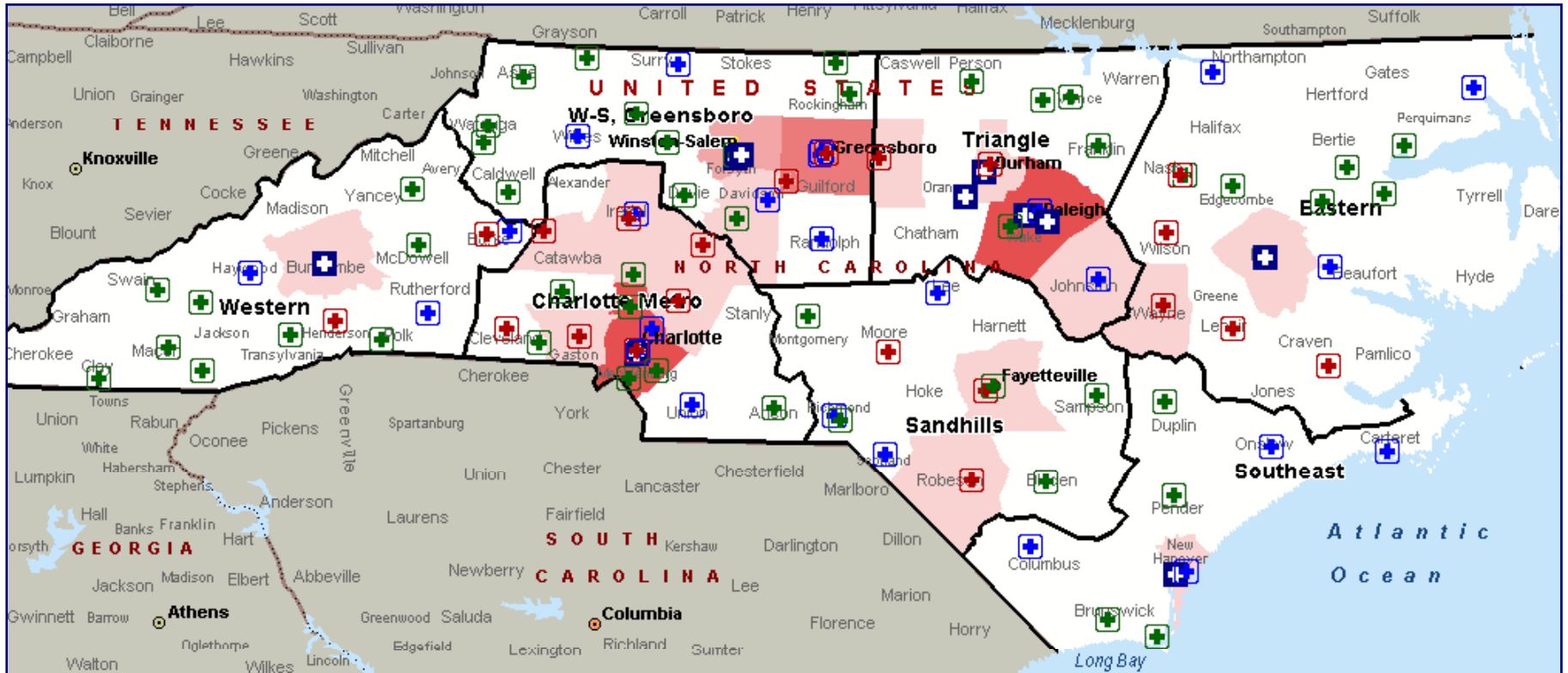
## A nationwide “Network of Networks” is Being Driven From The Top-down ... But Evolving From The Bottom Up



# Assumptions

- **Quality Costs Less & HIE = Quality**
- **Minimize duplication of effort in deploying HIE across North Carolina**
- **Statewide collaboration on key HIE initiatives will increase the overall net value of HIE across North Carolina.**
- **Enterprise or community level HIE solve local healthcare problems and provide “markets” for HIE solutions developed collaboratively statewide.**
- **An “on-ramp” of clinician connectivity will have an impact on this Business Plan**
- **Business Plan = first iteration**
- **HIE will utilize standards-based, non-proprietary approaches, and maintain hardware, software and even reimbursement system neutrality.**
- **To move beyond enterprise and community based HIE efforts, formal state-level authority appears needed in North Carolina.**
- **Benefits from HIE may not align with costs and therefore a re-balancing of costs and benefits will be necessary.**

# Hospitals in North Carolina by Medical Trading Area and Hospital Discharges by Patient's County of Residence\*



**Annual Discharges**

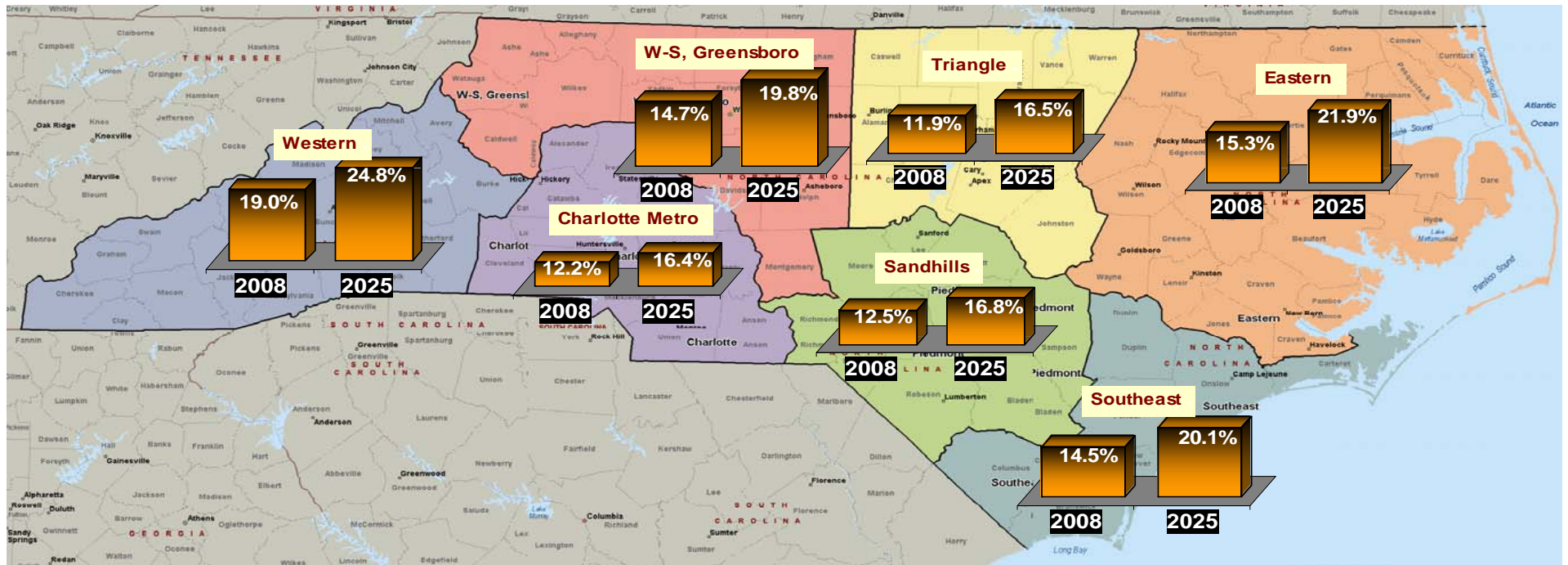
<span style="display:inline-block; width:15px; height:15px; background-color:#800000;"></span>	56,000 to 70,000
<span style="display:inline-block; width:15px; height:15px; background-color:#C00000;"></span>	42,000 to 55,999
<span style="display:inline-block; width:15px; height:15px; background-color:#E00000;"></span>	28,000 to 41,999
<span style="display:inline-block; width:15px; height:15px; background-color:#F00000;"></span>	14,000 to 27,999
<span style="display:inline-block; width:15px; height:15px; background-color:#FFFFFF;"></span>	0 to 13,999

**Registered Beds**

<span style="display:inline-block; width:15px; height:15px; border:1px solid black; background-color:blue; color:white; text-align:center; vertical-align:middle;">+</span>	600 to 1,000
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; background-color:red; color:white; text-align:center; vertical-align:middle;">+</span>	200 to 599
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; background-color:blue; color:white; text-align:center; vertical-align:middle;">+</span>	125 to 199
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; background-color:green; color:white; text-align:center; vertical-align:middle;">+</span>	0 to 124

\* Based on Kaiser Foundation and US Census Bureau Projections

# Projected dramatic expansion of 65+ age (Medicare) segment in North Carolina between 2008 and 2015\*. Significant variation by Medical Trading Area indicated.



\* Based on Kaiser Foundation and US Census Bureau Projections

## North Carolina – Proposed State-wide Initiative Areas to focus on to meet ONC project goal of “sustainable operations by 2012”

### Illustration of Potential Initiatives by Type (Red indicates analysis focus)

#### CORE + QUICK HITS

1. Summary Patient Record Exchange (**ER, Out-Patient, In-Patient, Consultant**)
2. Test Results Reporting (**Lab and Radiology**)
3. Medication Management (**Meds History**, ePrescribing, Meds Reconciliation)

#### EXTEND VALUE

4. Federal Agency Program Automation (**SSA**, Wounded Warrior)
5. Consumer / Provider Comm. (**Permissions, Access, Secure eMail**, Requests)
6. Provider / Provider Communication (**Secure eMail**, Referral Workflow)

#### TRANS- FORM

7. Patient Centered Medical Home Automation (Phys. Portal Dashboards)
8. Administrative Health Plan Data Exchange (Eligibility/Auth., EHR-Lite)
9. Population Health Automation (Registries, Case Reporting, Immunization)
10. Health Analytics (Quality Measures and Decision Support)

# North Carolina – Core and Quick Hit Initiatives

Potential five-year deployment and technology requirements

(Statewide – “Green”, Independent or Community-wide – “Yellow”)

Potential HIE Initiatives in North Carolina (Statewide - "Green" and Independent, Community-wide - "Yellow")		Years->													<-Technologies		
		2008	2009	2010	2011	2012	Core Exchange	Physician Directory	Access Permissions	Secure Email & Alerts	Workflow Mgmt.	Physician ID & Access	Physician Portal	Consumer ID & Access		Consumer Portal	
<b>CORE + QUICK HITS</b>	<b>1) Summary Patient Record Exchange</b>																
	Emergency Care Summaries →	Yellow	Green 1				Required	Required	Required	Optional							
	In-Patient Discharge Summaries →	Yellow	Green 1				Required	Required	Required	Optional							
	Out-Pat. Summaries & Consult Reports →			Green 1			Required	Required	Required	Optional							
	<b>2) Test Results Reporting</b>																
	Lab Results Delivery or Notification →	Yellow	Green 2				Required	Required	Required	Required	Optional						
	Radiology Reports Delivery / Notification →			Green 2			Required	Required	Required	Required	Optional						
	<b>3) Medication Management</b>																
	Medication History from PBMs →				Green 3		Required	Required	Required	Optional							
	ePrescribing - Electronic Orders / Refills	Yellow	Yellow	Yellow			Required										
Medication Reconciliation			Yellow	Yellow		Required											

“Yellow” Initiatives are likely to be (or are being) established locally by one or more local stakeholders to support local community objectives.

# North Carolina – Extended High Value Initiatives

Potential five-year deployment and technology requirements  
(Statewide – “Green”, Independent or Community-wide – “Yellow”)

Potential HIE Initiatives in North Carolina (Statewide - "Green" and Independent, Community-wide - "Yellow")		Years->					<-Technologies										
		2008	2009	2010	2011	2012	Core Exchange	Physician Directory	Access Permissions	Secure Email & Alerts	Workflow Mgmt.	Physician ID & Access	Consumer Portal	Consumer ID & Access			
<b>EXTEND HIGH VALUE</b>	<b>4) Federal Agency Program Automation</b>																
	Authorized Release of Information (SSA) →	4					☑	☑	☑			☑	✓	☑	✓		
	Wounded Warrior Data Exchange(VA, DoD)		5				☑		☑			☑	✓				
	<b>5) Consumer / Provider Communication</b>																
	Consumer Access and Permissions →		5				☑	☑	☑					☑	✓		
	Consumer / Physician Sec. Email & Alerts							☑		☑		☑		☑	✓		
	Patient to Physician Office Requests					5		☑		☑	☑	☑		☑	✓		
	<b>6) Provider to Provider Communication</b>																
	Secure Email Messaging →					6		☑		☑		☑					
	Referrals and Transfer of Care Workflow					5		☑			☑	☑	✓				

**KEY**

**Initiatives**

1 Statewide

Independent

**Technologies**

☑ Required

✓ Optional

“Yellow” Initiatives are likely to be (or are being) established locally by one or more local stakeholders to support local community objectives.

# North Carolina – Transforming Initiatives

Potential five year deployment and technology requirements  
(Statewide – “Green”, Independent or Community-wide – “Yellow”)

Potential HIE Initiatives in North Carolina (Statewide - "Green" and Independent, Community-wide - "Yellow")		Years->					<-Technologies								
		2008	2009	2010	2011	2012	Core Exchange	Physician Directory	Access Permissions	Secure Email & Alerts	Workflow Mgmt.	Physician ID & Access	Consumer Portal	Consumer ID & Access	Consumer Portal
<b>TRANSFORM</b>	<b>7) Patient Centered Medical Home</b>														
	Organize PCMH Networks & Sponsorship	Yellow	Yellow												
	Initiate PCMH Pilot Sites		Yellow	Yellow											
	Integrate PCMH with HIE Infrastructure →				7		Green	Green	Green	Green	Green	Green	Green	Green	Green
	Align Reimbursement with PCMH				Yellow	Yellow									
	<b>8) Administrative Health Plan Exchange</b>														
	Eligibility/Authorization of		Yellow	Yellow						Green	Green	Optional	Optional	Optional	
	EHR-Lite - with Health Plan Claims Data			Yellow			Green			Green	Optional				
	<b>9) Population Health Initiative Automation</b>														
	Biosurveillance & Situational Awareness	Yellow	Yellow	Yellow	Yellow	Yellow									
	Electronic Population Health Case			Yellow	Yellow	Yellow				Green	Optional				
	Immunization Records & Disease Registries	Yellow	Yellow	Yellow	Yellow	Yellow				Green	Optional				
	<b>10) Health Analytics</b>														
	Quality Measures		Yellow	Yellow	Yellow					Green	Optional				
Decision Support				Yellow	Yellow				Green	Green	Green				

**KEY**

**Initiatives**

1 Statewide








Independent

**Technologies**

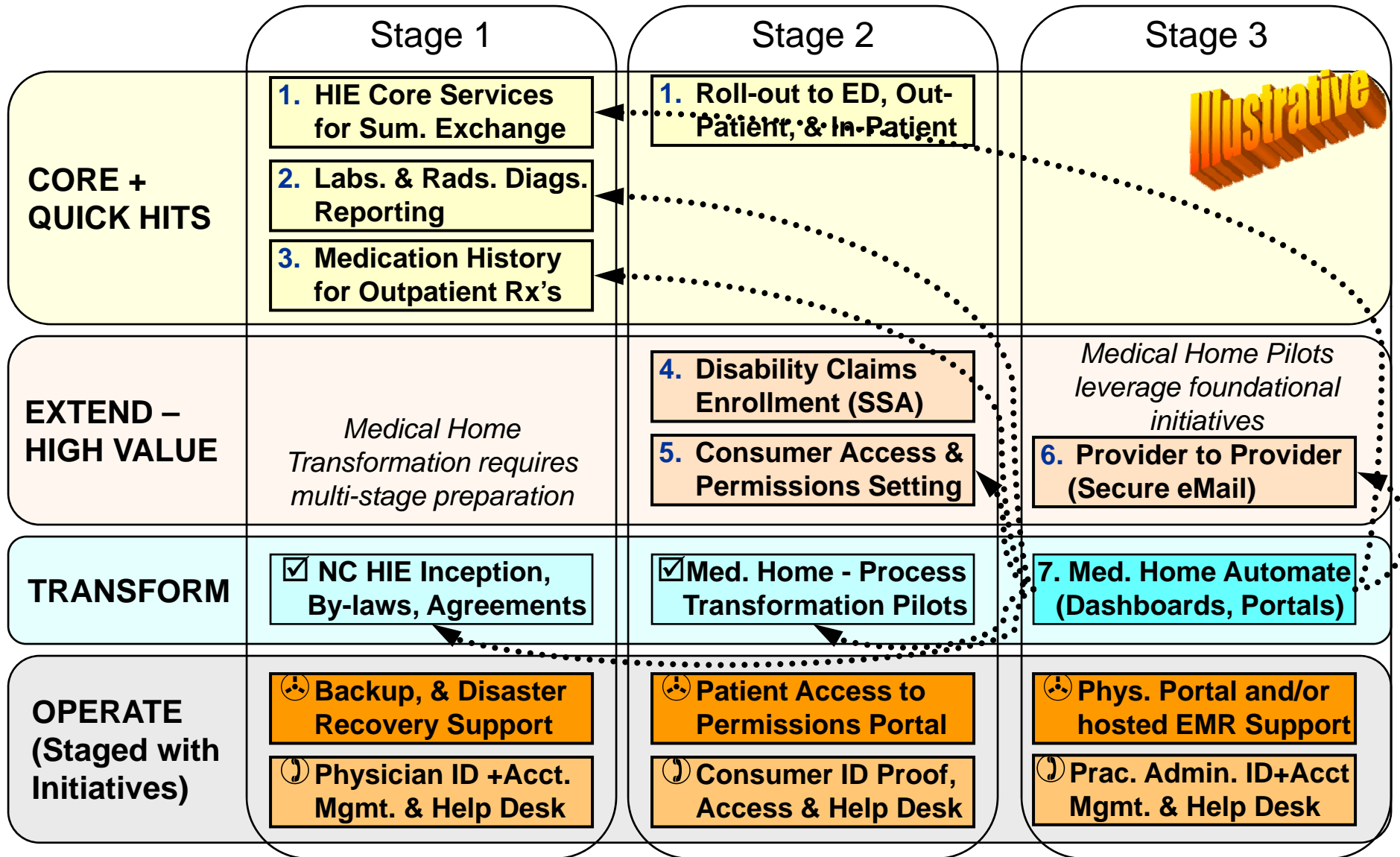
☑ Required

✓ Optional

# North Carolina – 3-Stage, Multi-year Deployment Program

	Stage 1	Stage 2	Stage 3
<b>CORE + QUICK HITS</b>	<ul style="list-style-type: none"> <li>1. HIE Core Services for Sum. Exchange</li> <li>2. Labs. &amp; Rads. Diags. Reporting</li> <li>3. Medication History for Outpatient Rx's</li> </ul>	<ul style="list-style-type: none"> <li>1. Roll-out to ED, Out-Patient, &amp; In-Patient</li> </ul>	
<b>EXTEND – HIGH VALUE</b>		<ul style="list-style-type: none"> <li>4. Disability Claims Enrollment (SSA)</li> <li>5. Consumer Access &amp; Permissions Setting</li> </ul>	<ul style="list-style-type: none"> <li>6. Provider to Provider (Secure eMail)</li> </ul>
<b>TRANSFORM</b>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> NC HIE Inception, By-laws, Agreements</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Med. Home - Process Transformation Pilots</li> </ul>	<ul style="list-style-type: none"> <li>7. Med. Home Automate (Dashboards, Portals)</li> </ul>
<b>OPERATE (Staged with Initiatives)</b>	<ul style="list-style-type: none"> <li> Backup, &amp; Disaster Recovery Support</li> <li> Physician ID +Acct. Mgmt. &amp; Help Desk</li> </ul>	<ul style="list-style-type: none"> <li> Patient Access to Permissions Portal</li> <li> Consumer ID Proof, Access &amp; Help Desk</li> </ul>	<ul style="list-style-type: none"> <li> Phys. Portal and/or hosted EMR Support</li> <li> Prac. Admin. ID+Acct Mgmt. &amp; Help Desk</li> </ul>

# North Carolina – 3-Stage, Multi-year Deployment Program



# Assumptions for Business Plan

- **Objective: Cost justify statewide Health Information Exchanges compatible with shared national standards**
- **Ultimate rationale for technology enablement is based on improving quality and transparency in health care delivery**
- **Cost effectiveness is also paramount; Successful adoption demands that overall quantitative benefits significantly outpace cost and that the benefits can be proportionately distributed (shared)**
- **Scale-driven technology components (particularly for the “green” - statewide initiatives though for “yellow” - independent ones as well) may benefit considerably by a “shared services” approach.**
- **The model must account for varying rates of adoption by stakeholder group (e.g., physicians, hospitals) as well as by geography.**
- **Model takes a holistic approach with a “program” of initiatives; these are initiatives that have demonstrated positive acceptance and value in other sustaining HIEs.**

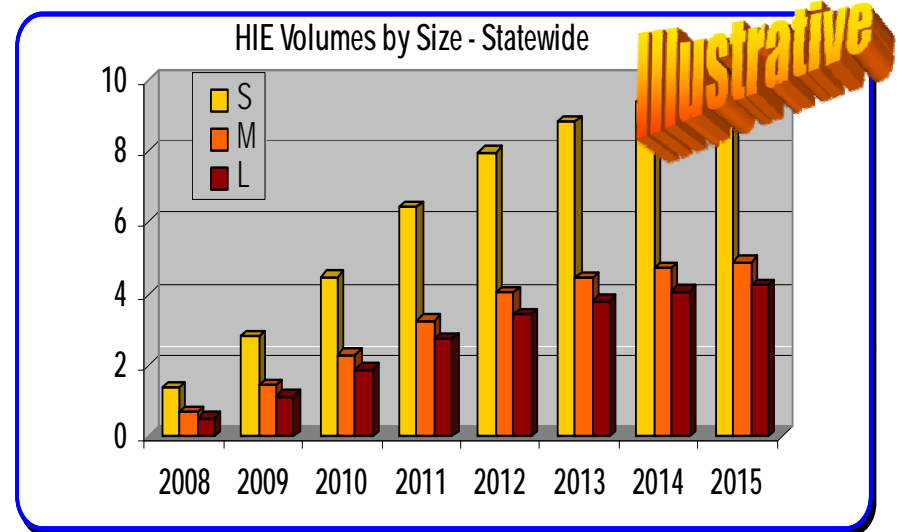
# Assumptions for Business Plan

- The model’s market segmentation assumes that individual HIEs and “yellow” initiatives already underway while others emerge and commence operations on a delayed time scale.
- Community HIEs are classified as “small”, “medium” and “large” and key stakeholders (physicians, hospitals) are assigned a “home” HIE, to avoid redundant counting.
- While benefits may clearly outpace costs for the proposed initiatives, the one-time and on-going costs are sizeable implying that some type of formal state-level authority appears needed in North Carolina.
- Benefits from HIE may not align with costs and therefore a re-balancing of costs and benefits will be necessary.

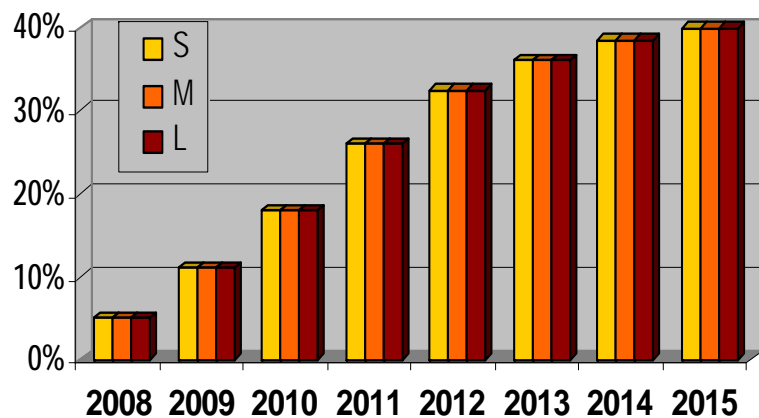
# NC HIE Model based on statewide demographics accounts for adoption growth of HIEs, and key stakeholder groups

HIE Units' - Population and Stakeholder Group Sizes

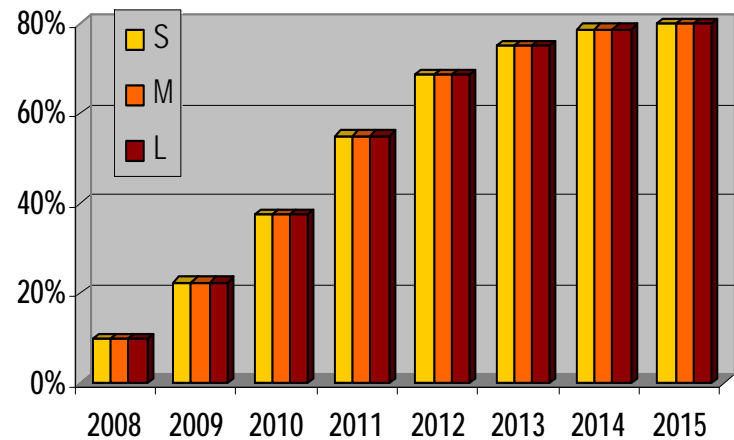
<u>Characteristics</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>
- Population	250,000	550,000	1,000,000
- Physicians	475	1,045	1,900
- Hospitals/IDNs	3	7	12
- Private Payers	6	5	6
- Local Labs/Rads	2	2	4
- Govt. Payer - State, Federal	1	1	1
- Gov. Contracts & Philanthropy	1	1	1



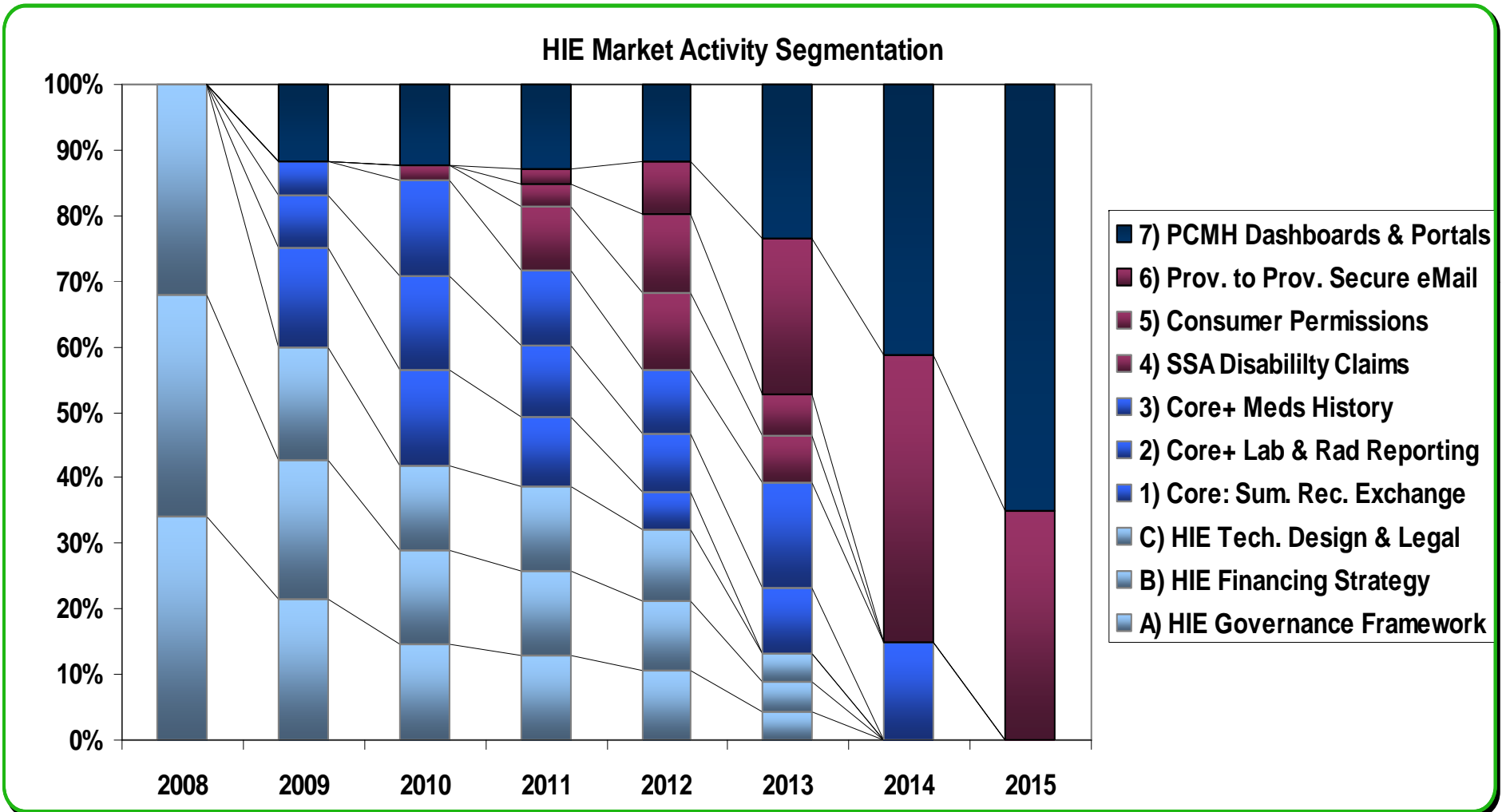
HIE Membership - Physician Adoption Rates



HIE Membership - Hospital Adoption Rates



# Market segmentation scenario for NC HIE in North Carolina illustrated with proposed program of “green” initiatives



Note: this model assumes individual HIEs and initiatives already underway while others emerge and begin operations during this time window.

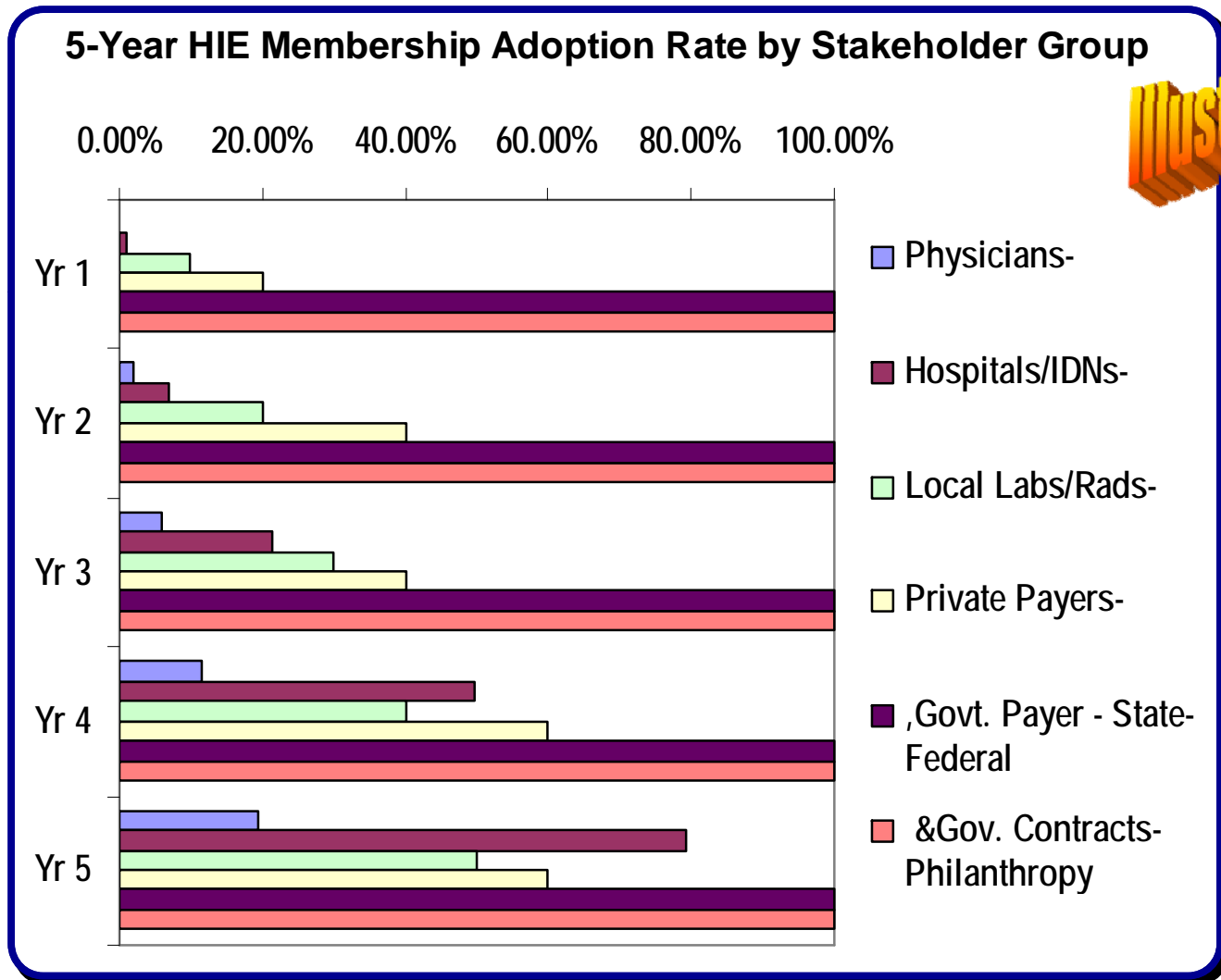
# Stakeholder Alignment for Summary Patient Record Exchange initiative illustrates the challenge of misaligned costs and benefits

**Illustrative**

Stakeholders:	Participant	Funder <sup>1</sup>	Qual. <sup>2</sup>	Quant. <sup>2</sup>	Costs
Hospitals	✓✓	\$\$	+++	\$	\$\$\$
Physicians	✓✓		+++	\$	\$
Payers (private)	✓	\$	+++	\$\$\$	\$
Payers (gov't)	✓	\$	+++	\$\$\$	\$
Gov't Grants		\$\$			
Population Health	✓		++		\$
Researchers	✓		++	\$	\$
Patients	✓		+++	\$	
Employers	✓	\$	+	\$	

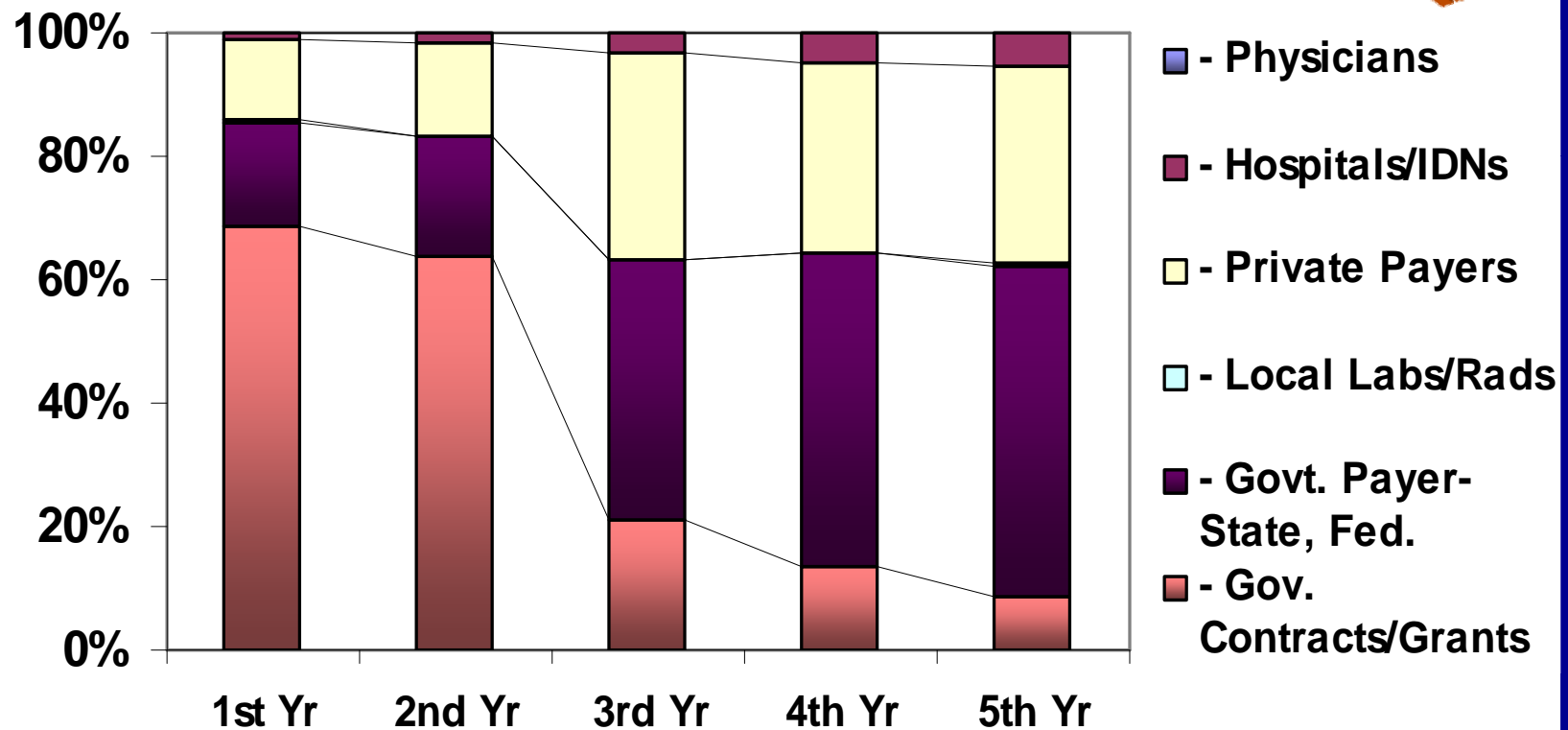
<sup>1</sup> Potential Initiative Financiers; <sup>2</sup> Projected Qualitative & Quantitative Benefits.

# Assumed adoption growth in demand for services by year by stakeholder group



Since the costs are significant some the stakeholders will need to determine and agree upon an equitable cost sharing approach; one hypothetical scenario ....

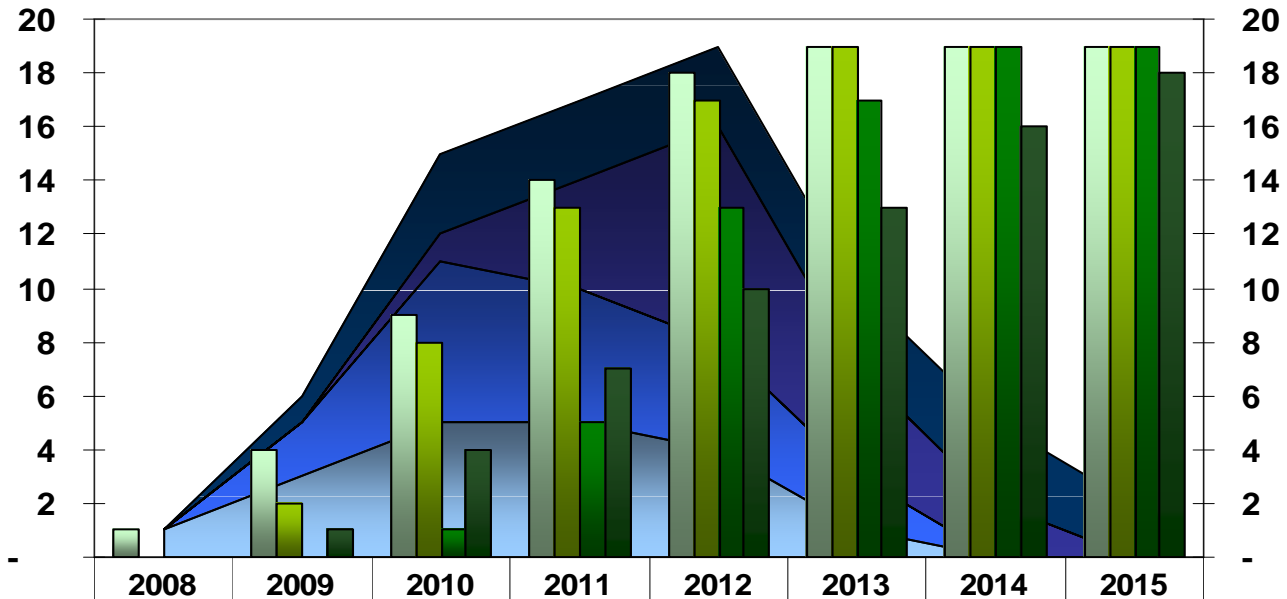
**Illustrative**



Percent of 5-Year Annual HIE Fees by each Stakeholder Group

# Projected HIE Volume of Core, Value-Add and Transforming Initiatives by Year

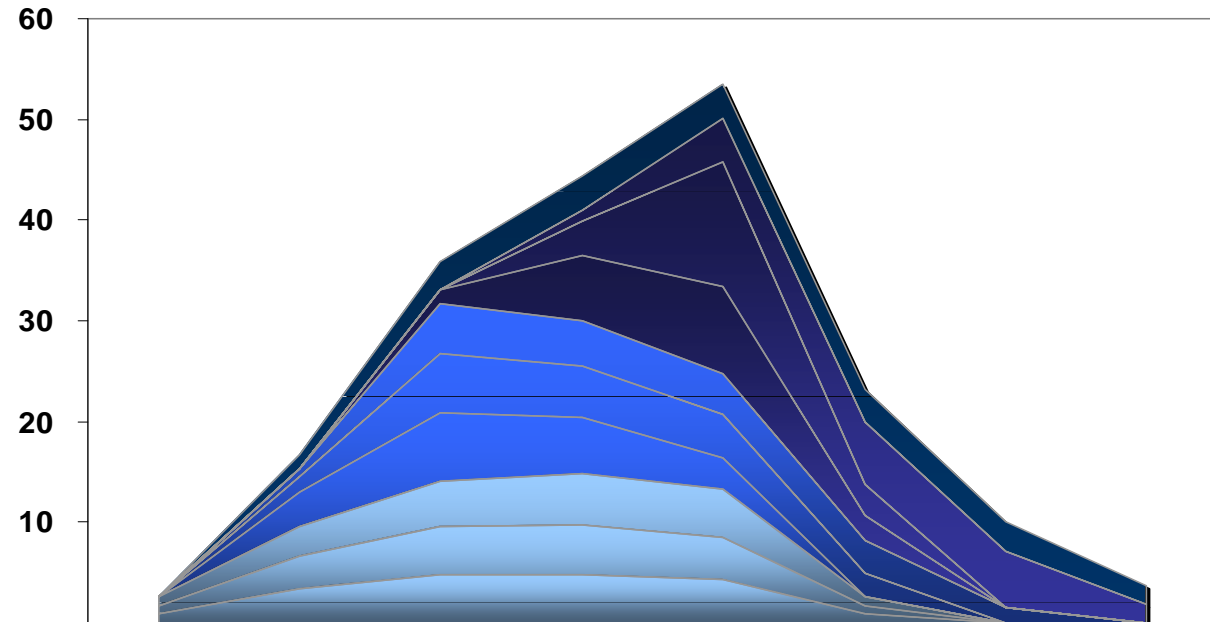
**Illustrative**



	2008	2009	2010	2011	2012	2013	2014	2015
Transforming - Initiated	-	1	3	3	3	3	3	2
Value-Add - Initiated	-	-	1	4	8	4	2	-
Core - Initiated	-	2	6	5	4	2	-	-
Planning - Initiated	1	3	5	5	4	1	-	-
Transforming - Cumulative	-	1	4	7	10	13	16	18
Value-Add - Cumulative	-	-	1	5	13	17	19	19
Core - Cumulative	-	2	8	13	17	19	19	19
Planning - Cumulative	1	4	9	14	18	19	19	19

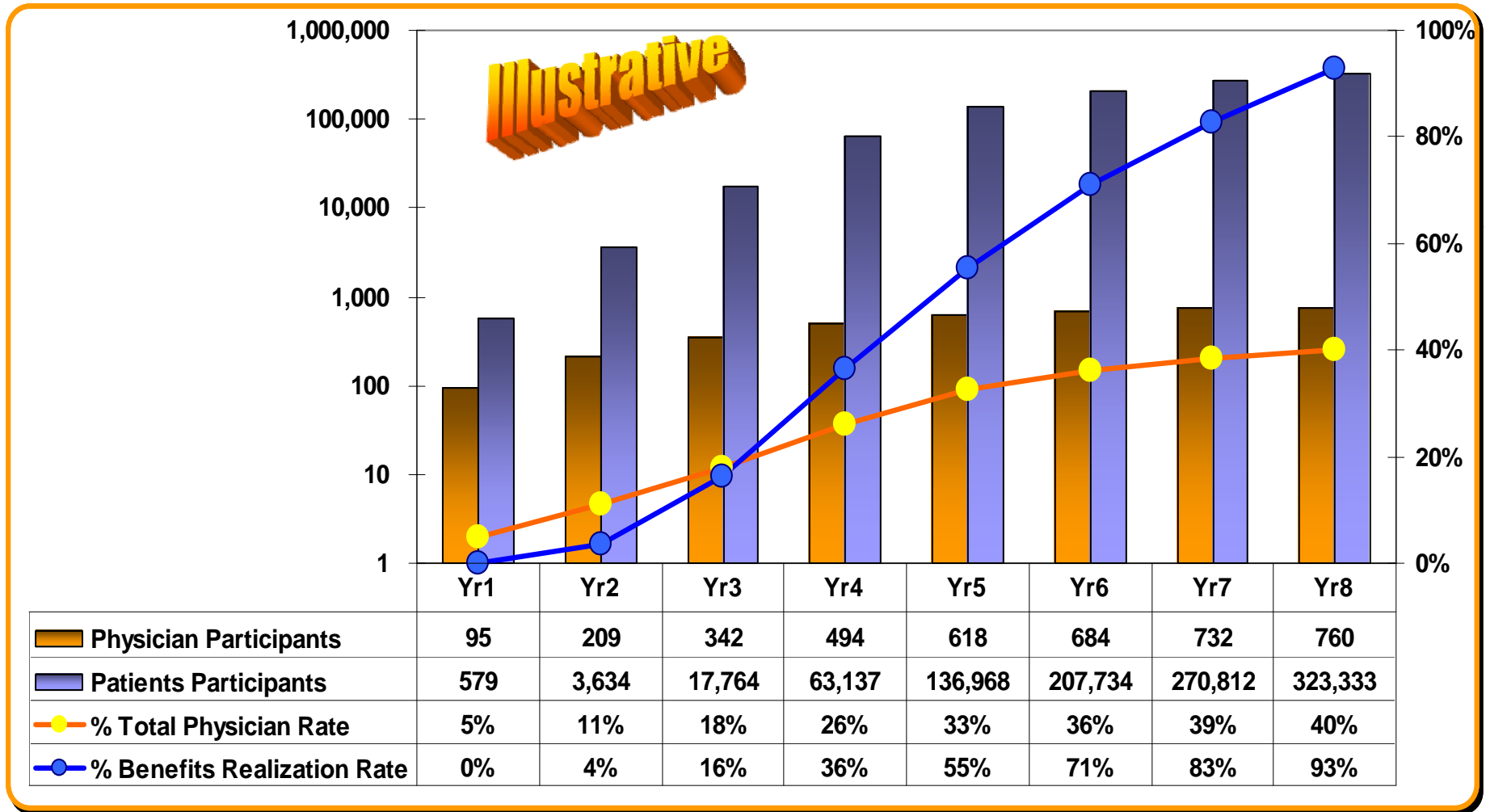
# Projected Implementation Schedule across HIEs

**Illustrative**

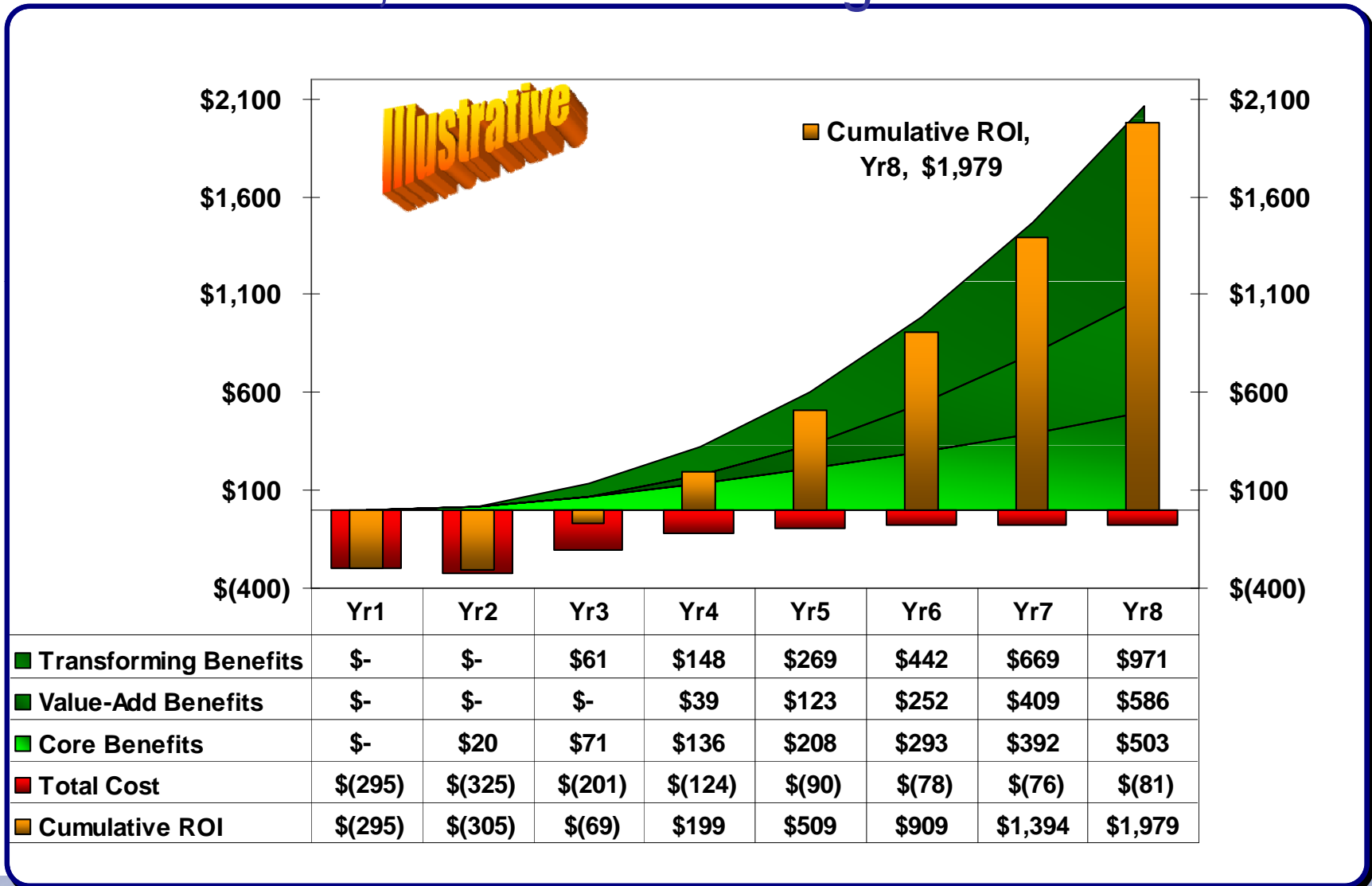


	2008	2009	2010	2011	2012	2013	2014	2015
■ 7) Transform: Dashboards / Portals	-	1	3	3	3	3	3	2
■ 6) Value+: Prov. to Prov. Sec. eMail	-	-	-	1	4	6	6	2
■ 5) Value+: Consumer Permissions	-	-	-	3	12	3	-	-
■ 4) Value+ SSA Disability Claims	-	-	1	7	9	2	-	-
■ 3) Core+ Meds History	-	1	5	4	4	3	1	-
■ 2) Core+ Lab & Rad Reporting	-	2	6	5	4	2	-	-
■ 1) Core: Sum. Rec. Exchange	-	3	7	6	3	-	-	-
■ C) HIE Tech. Design & Legal	1	3	5	5	5	1	-	-
■ B) HIE Financing Strategy	1	3	5	5	4	1	-	-
■ A) HIE Governance Framework	1	3	5	5	4	1	-	-

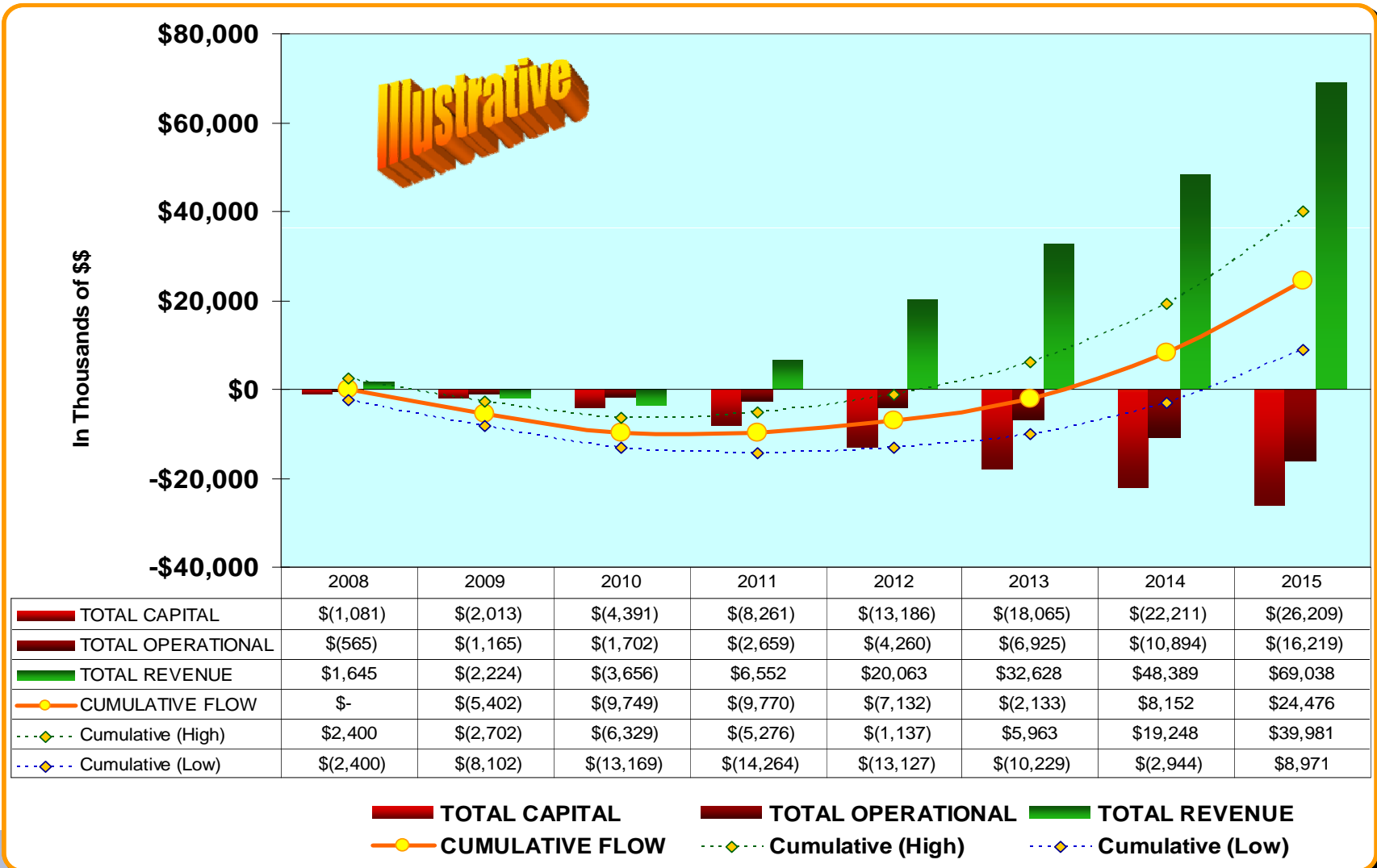
# Projected Physician and Patient Participation and Benefits Realization Rate Projection



# ROI over cost for implementation of Core, Value-Add, and Transforming Initiatives



## Cost Revenue Simulation for a North Carolina State-wide Public/Private Health Information Exchange; positive ROI after 5.7 years; Multiple HIEs cover population of > 5,000,000



# Improved efficiency in coordinating care attributed solely to HIE technology automation of Medical Home processes

<b>Cost Avoidance through Technology Enablement</b>		Top	Next	Next	Next	Lowest	
Population Segments by % Segments		1%	4%	5%	40%	50%	101.00%
Population Segments by (circa 2004) #		86,638	346,553	433,191	3,465,532	4,331,915	8,663,829
Total Expended in US Average (circa 2002)* %		22%	27%	15%	33%	3%	
Total Expended in US Average (millions \$\$)		\$9,742	\$11,956	\$6,642	\$14,613	\$1,328	\$44,281
Per Capita Expenditure by Segment (\$\$)		\$112,442	\$34,499	\$15,333	\$4,217	\$307	\$5,111 **
Per Capita Benefits (Savings)		5.00%	5.00%	4.50%	1.50%	0.75%	3.64%
Per Capita Adjusted Expenditure		\$106,820	\$32,774	\$14,643	\$4,153	\$304	\$4,925
		Top 1%	4%	5%	40%	50%	100.00%
Total Annual Savings (millions \$)		\$487	\$598	\$299	\$219	\$10	\$1,613
Adjusted Total Healthcare Spend		\$9,255	\$11,358	\$6,343	\$14,394	\$1,318	\$42,668
<b>Benefits by Individual in Aggregated Percentiles</b>		Aggregated Ranges in (millions \$)					
Top Aggregate % of Healthcare Spend		Top 1%	Top 5%	Top 10%	Top 50%	100%	Top 20%
1) Core+ - Average Annual Savings***		\$1,124	\$501	\$327	\$82	\$42	\$174
2) Value-Add - Average Annual Savings***		\$1,687	\$751	\$452	\$124	\$63	\$247
3) Transforming - Average Annual Savings***		\$2,811	\$1,252	\$818	\$164	\$82	\$409
Total Average Savings***		\$5,622	\$2,504	\$1,597	\$370	\$186	\$830

\* Medical Expenditure Panel Survey Statistical Brief #81, Yu, William W. & Trena M.Ezzati-Rice, AHRQ, May 2005.

\*\* Kaiser Family Foundation, Health Care Expenditures per Capita by Service by State of Residence, 2004

\*\*\* Per Capita by Aggregated Segments (\$\$)

# Summary of Benefits by Initiative

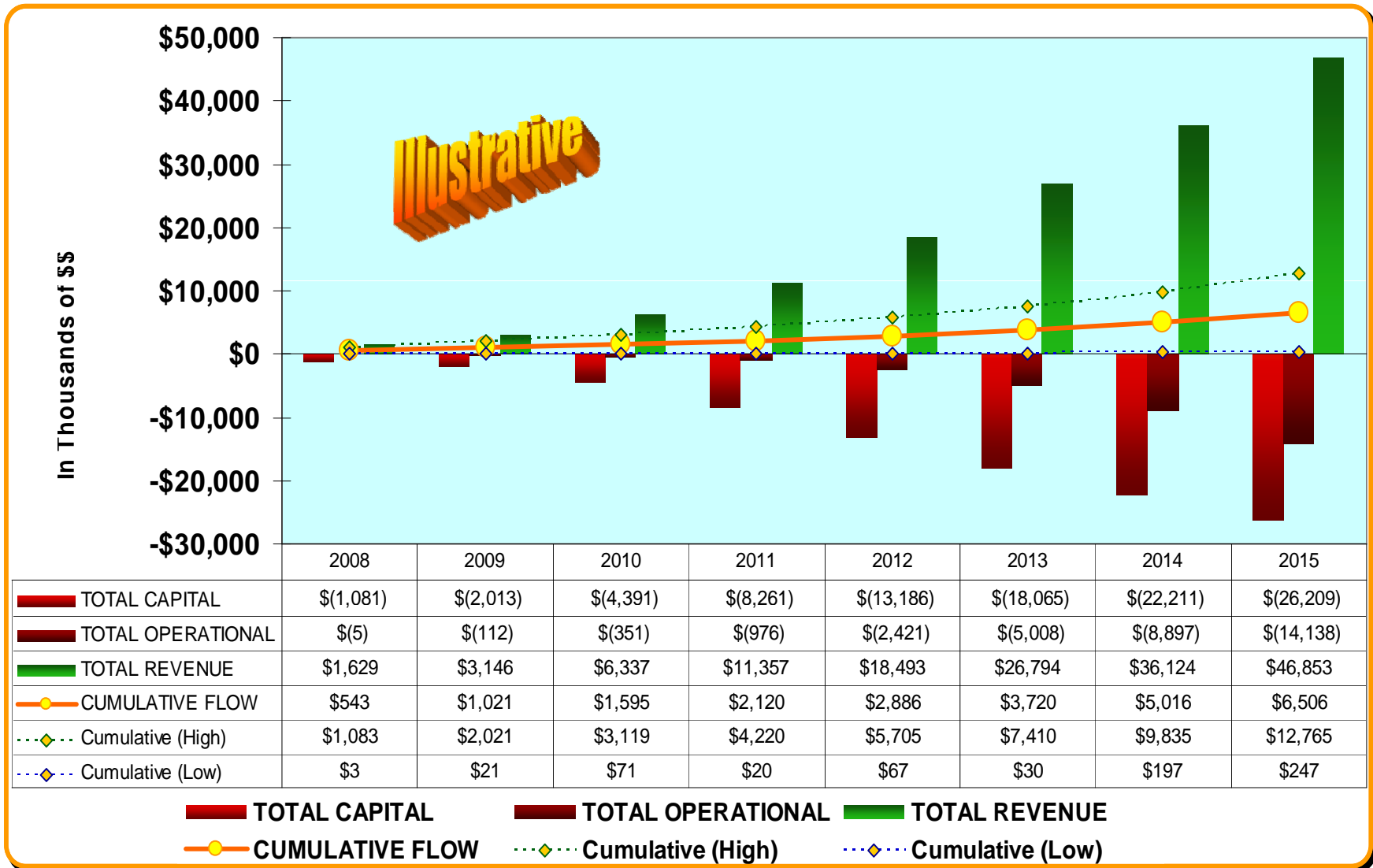
<b>Annual Cost Efficiency Improvements</b>	<b>1%</b>	<b>4%</b>	<b>5%</b>	<b>40%</b>	<b>50%</b>	<b>100%</b>	<b>Top 20%</b>
<b>1) Exchange of Summary Patient Record</b> - Decreased cost for number of readmits <u>Who:</u> post-acute patients <u>How:</u> due to readily available discharge summary. <sup>15</sup>	\$562	\$172	\$77			\$16	\$82
<b>2) Diagnostic Results</b> - Reduced cost for unnecessary lab orders, inappropriate treatment, and office efficiency <u>Who:</u> ER patients (+ some referrals) <u>How:</u> increased speed and completeness of diagnosis due to patient centric lab results history. <sup>10</sup>	\$281	\$86	\$38	\$11		\$12	\$46
<b>3) Medication History</b> - Decrease in severe, preventable medication errors <u>How:</u> due to availability of medication history <sup>11</sup>	\$281	\$86	\$38	\$11	\$1	\$13	\$46
<b>4) SSA Authorized Access to Clin. Info.</b> - Reduced cost and time for authorized access to support disability claims <u>How:</u> SSA "smart form" workflow and HIE Core services <sup>9</sup>	\$562	\$172				\$13	\$63
<b>5) Consumer to Provider Communications</b> - Reduced cost for unnecessary in-patient and inappropriate ER visits <u>How:</u> access to dashboards through portal interface <sup>5, 6, 7, 13</sup>	\$562	\$172	\$77	\$21	\$2	\$26	\$92
<b>6) Provider to Provider Communication</b> - Improved efficiency in coordinating care <u>How:</u> secure email communications and "smart" forms via physician portal interface <sup>8</sup>	\$562	\$172	\$77	\$21		\$25	\$92
<b>7) Care-Coordination</b> - Reduced cost of inappropriate ER visits and hospital [re-] admissions <u>Who:</u> patients with 1 or more chronic diseases <u>How:</u> real-time availability of patient centric record. <sup>1, 2, 3, 4, 12</sup>	\$2,811	\$862	\$383			\$82	\$409

# References for Benefits

## References

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- 2 Ronald A. Paulus, Karen Davis, and Glenn D. Steele. Continuous Innovation In Health Care: Implications Of The Geisinger Experience. Health Affairs Vol 27, No 5 (2008): 1235-1245
- 3 Andy Opsahl. States Reduce Medicaid Costs with New Technology. Government Technology, June 3, 2008. <<http://www.govtech.com/gt/366267>>
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- 6 RelayHealth and BlueCross BlueShield of Massachusetts. Physician-Patient Connectivity (2003). <[http://www.mahealthdata.org/forums/events/2004/HIT\\_0206/slides/HIT04\\_Plourde-V.pdf](http://www.mahealthdata.org/forums/events/2004/HIT_0206/slides/HIT04_Plourde-V.pdf)>
- 7 Katie Merx. University of Michigan and Henry Ford try on-line doctor consults. USA Today, March 20, 2006. <[http://www.usatoday.com/money/industries/health/2006-03-20-online-docs\\_x.htm](http://www.usatoday.com/money/industries/health/2006-03-20-online-docs_x.htm)>
- 8 Peter Kuhn. Closer View of E-health. advance for Health Information Executives; Volume 11, Issue 12, pg. 33. <[http://health-care-it.advanceweb.com/Editorial/Search/AViewer.aspx?AN=HX\\_07dec1\\_hxp33.html&AD=12-01-2007](http://health-care-it.advanceweb.com/Editorial/Search/AViewer.aspx?AN=HX_07dec1_hxp33.html&AD=12-01-2007)>
- 9 John D. Halamka,. Automating the Disability Process with National Standards; July 30, 2008. Accessed July 31, 2008 <<http://geekdoctor.blogspot.com/2008/07/automating-disability-process-with.html>>
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- 11 American Society of Health System Pharmacists. Return on Investment for Medication Reconciliation Upon Admission, August 2007. <<http://209.85.173.104/search?q=cache:X->
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# 8 Year Stakeholder Funded Simulation for a Statewide North Carolina Public/Private Health Information Exchange



**Cost / benefit model for medium-sized NC HIE with 40% of a region's 550k patients participating; A positive 141% RIO is achieved by year 5 and > 500% by year 8.**

