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Advancing Excellence in Health Care www.ahrq.gov

A business case for Health IT Adoption:

Effects of *"meaningful use"* EHR financial incentives on clinic revenue

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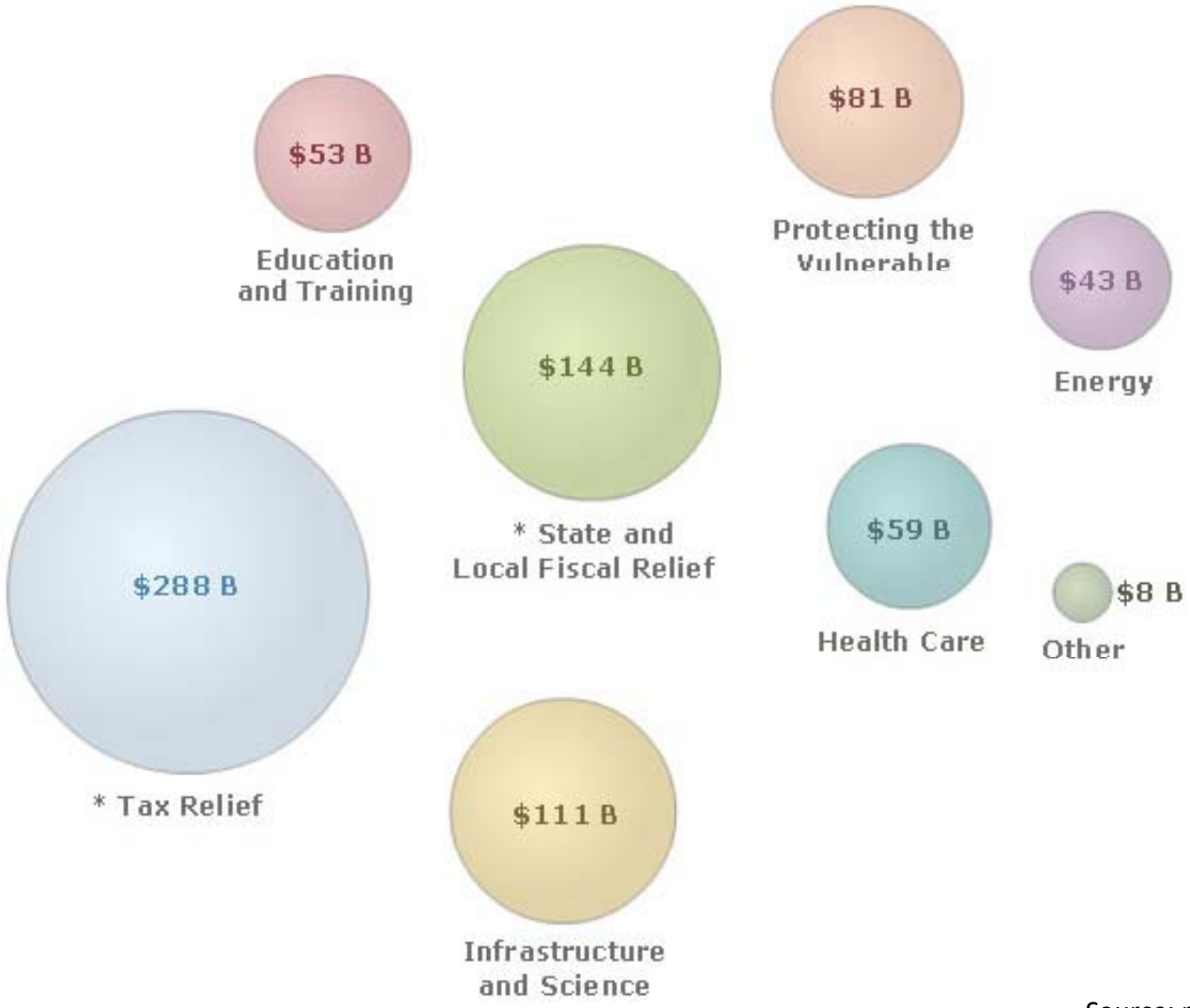
Introduction

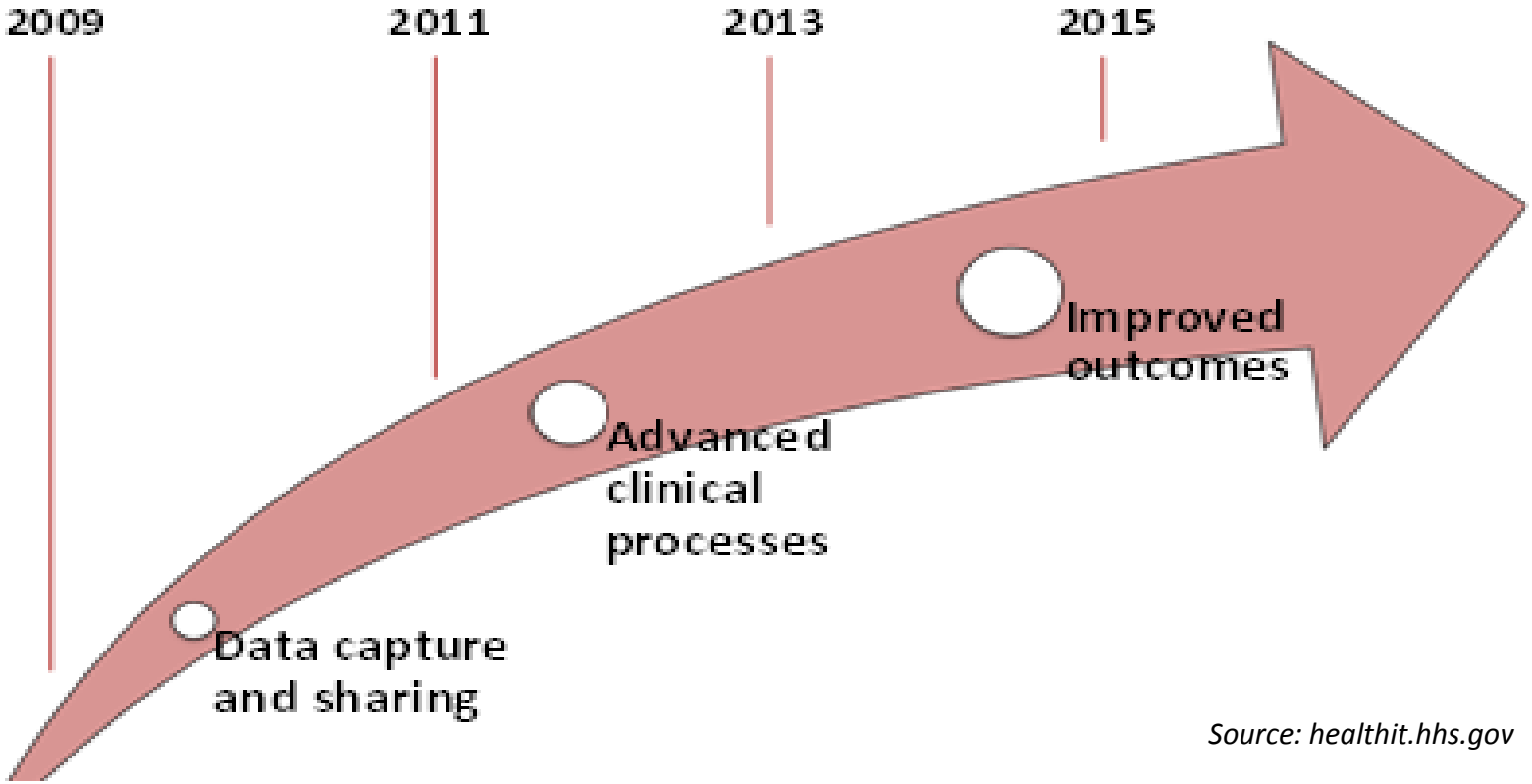
American Recovery and Reinvestment Act of 2009 (ARRA)



Source: recovery.gov

HITECH: The Health Information Technology for Economic and Clinical Health Act

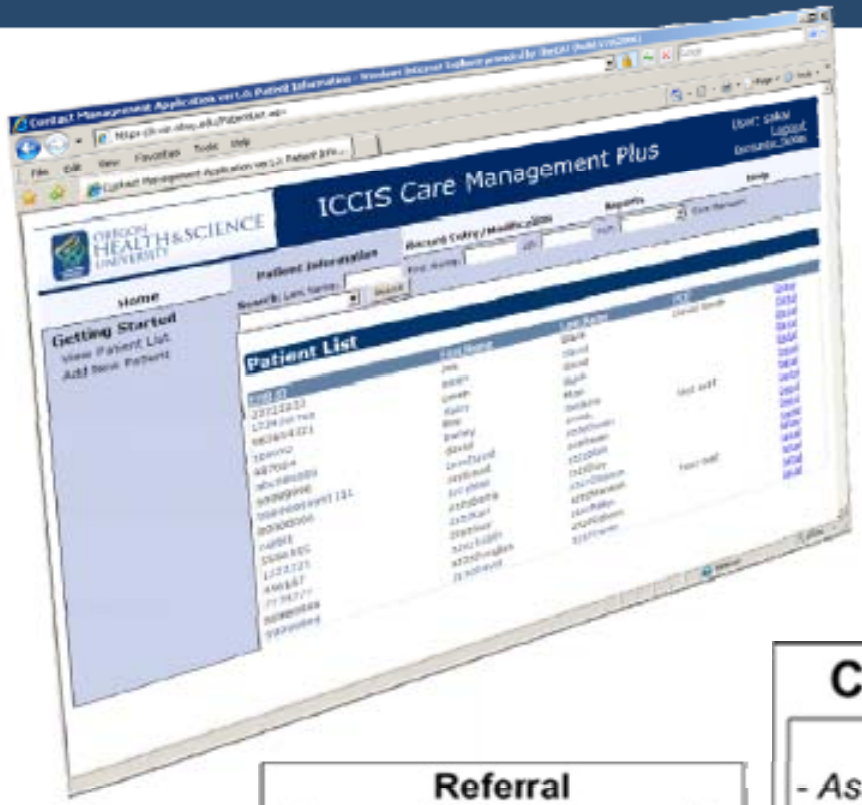
- $27 billion over 10 years
- $44,000/ physician (Medicare)
- $64,000/ physician (Medicaid)



Source: healthit.hhs.gov

What does this mean?
How can we achieve this?

Care Management Plus Program



source: caremanagementplus.org

Care management

Referral
- For any condition or need
- Focus on certain conditions

Care manager
- *Assess & plan*
- *Catalyst*
- *Structure*

Technology
- *Access*
- *Best Practices*
- *Communication*

Evaluation
- Ongoing with feedback
- Based on key process and outcome measures

Intermountain Healthcare

Study Design

Objective

- **Objective:** Create a framework that would allow decision-makers (policy-setters or end-user clinics) to efficiently evaluate factors that affect EHR adoption and test suitable interventions.

- **Method:** Using system dynamics modeling we created a simulation to evaluate EHR adoption (with CMP).

- **Verification:** Using Scenario Analysis we evaluated the adoption process for three types of clinics (that already use CMP).

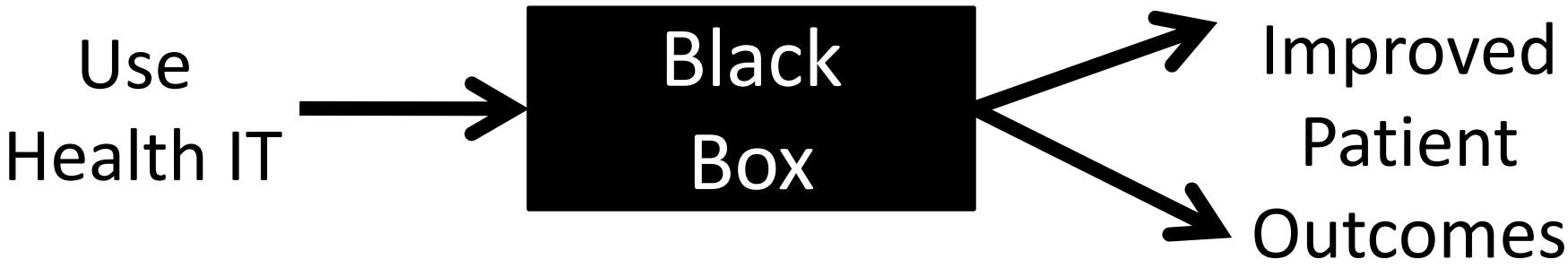
Hypothesis

H1: The more a Physician or a Nurse Care Manager is aware of HIT benefits, the higher the quality of HIT adoption.

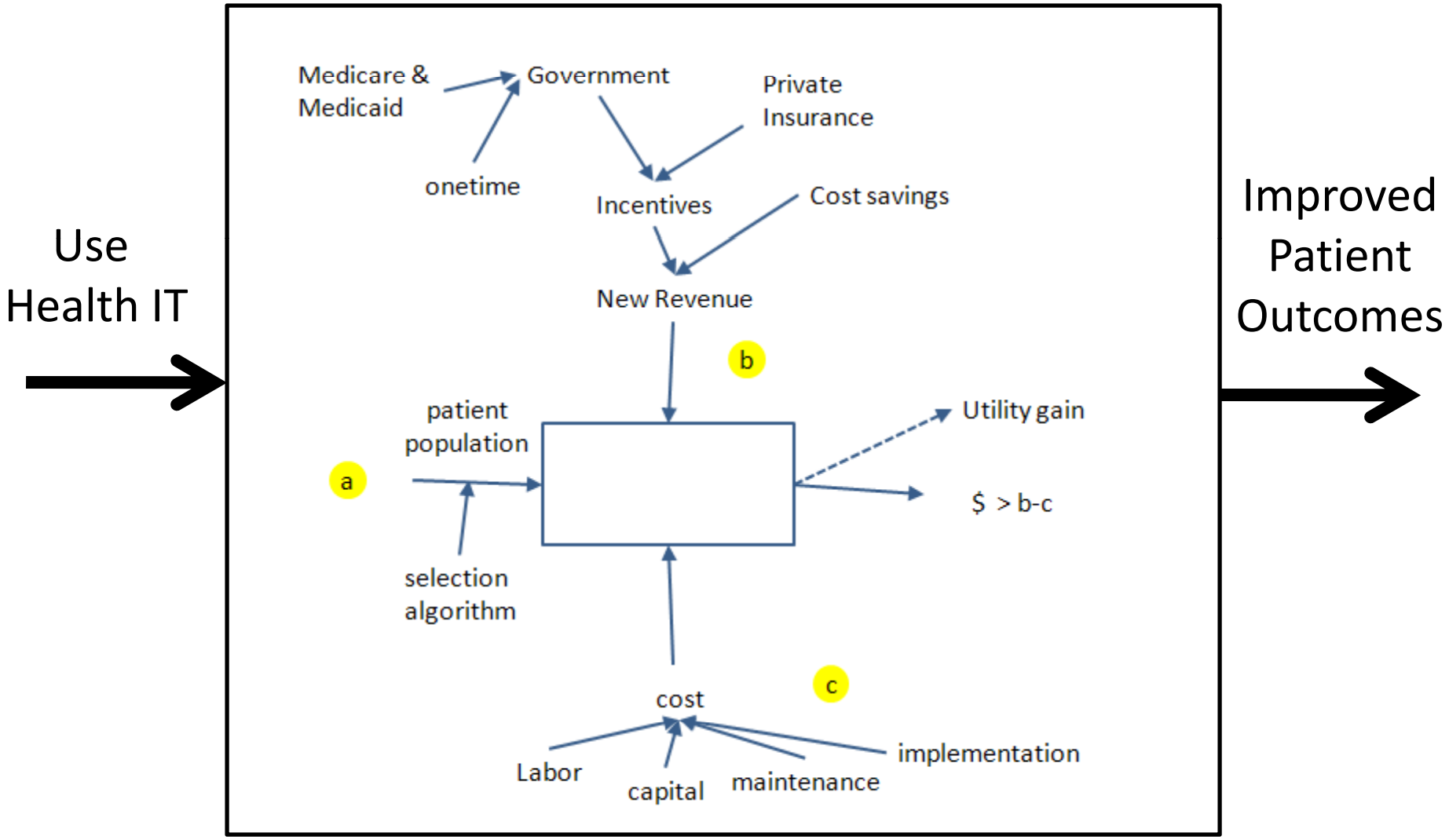
H2: The level and quality of "meaningful-use" implemented by the clinic (low, medium or high) will affect likelihood of successful adoption.

H3: Presence of Financial incentives will positively influence the use of HIT in hospitals and physicians offices.

Traditional Logical Model

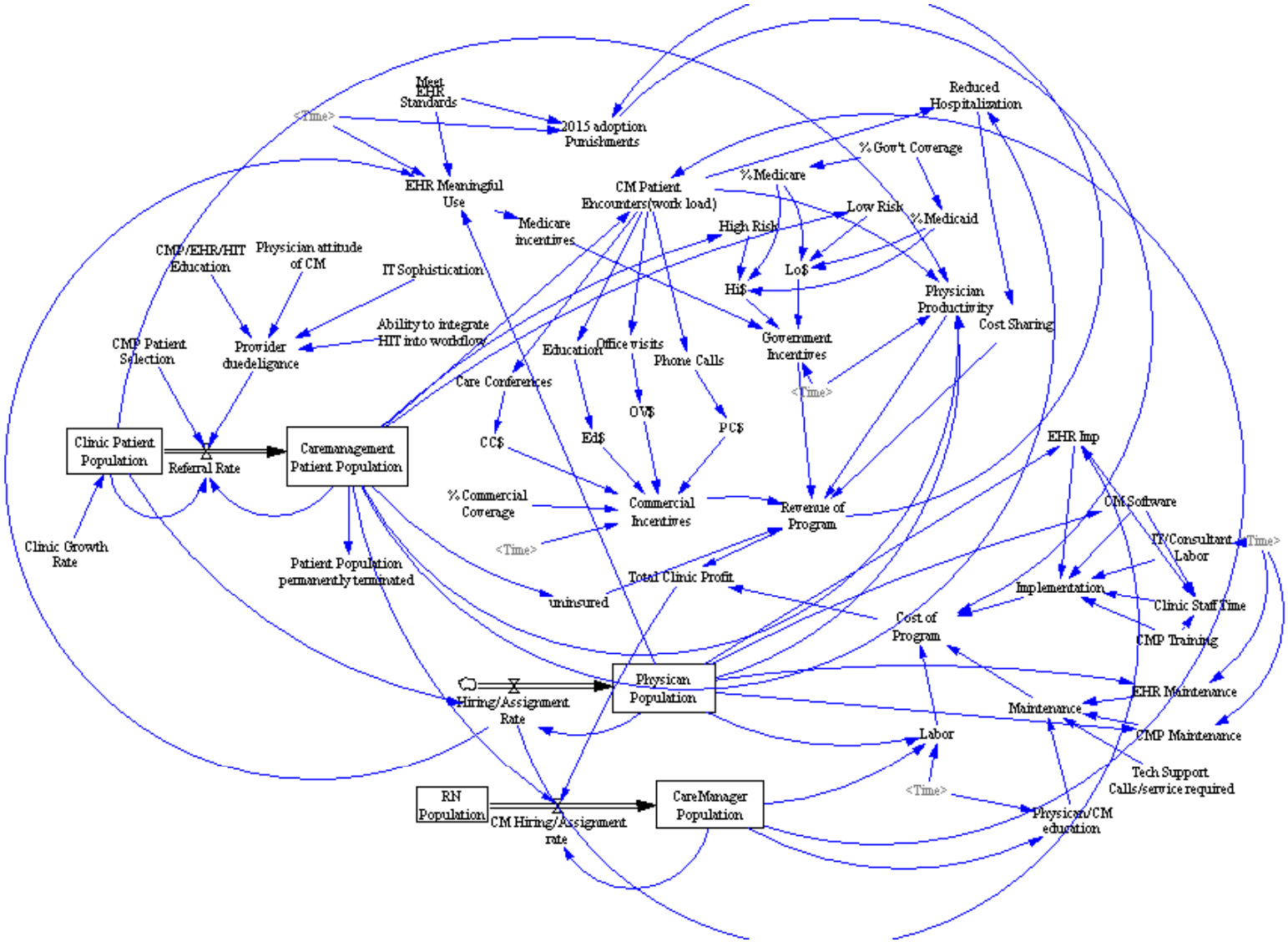


An incentive-based logical model

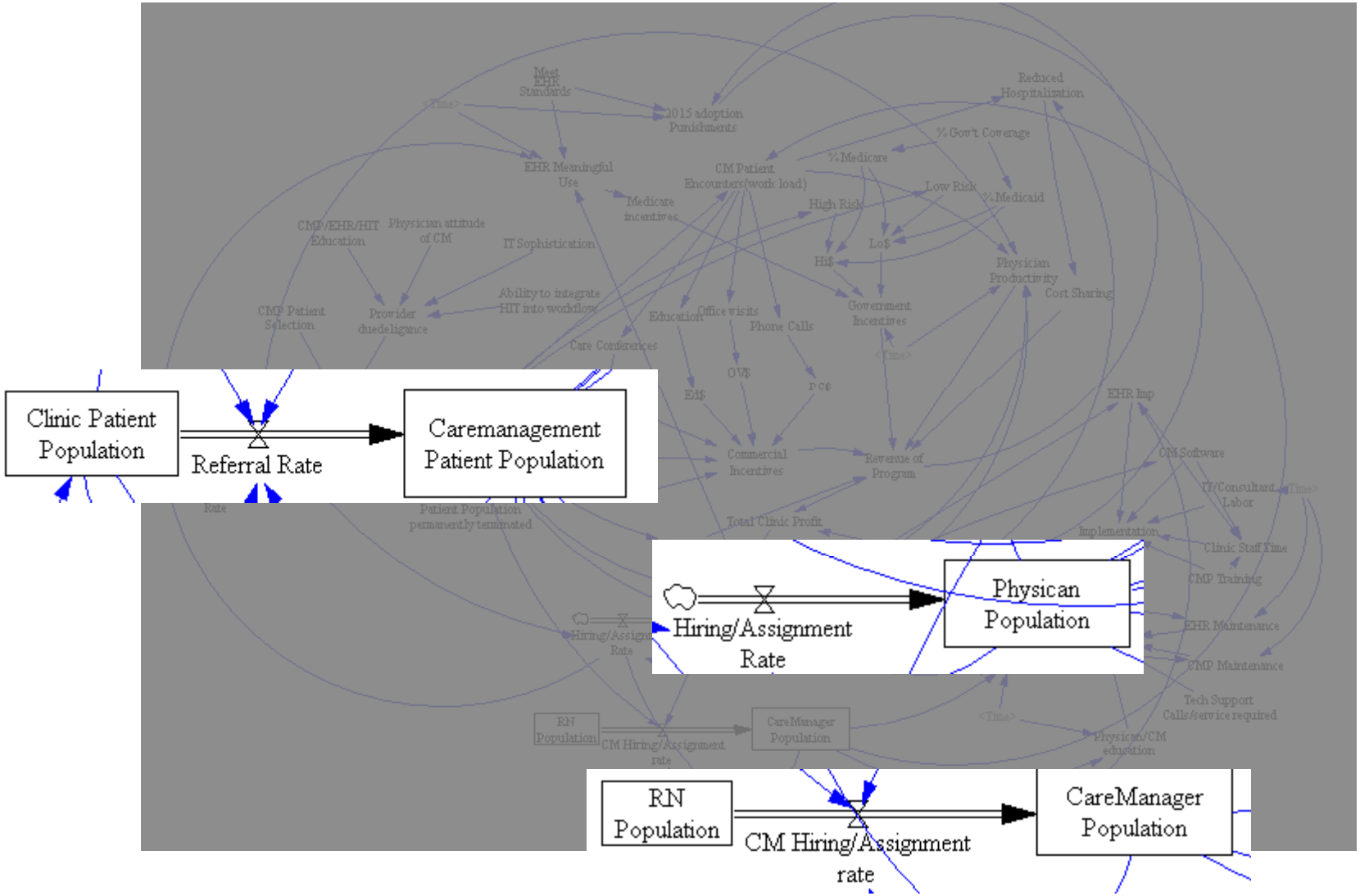


The full System Dynamics Model

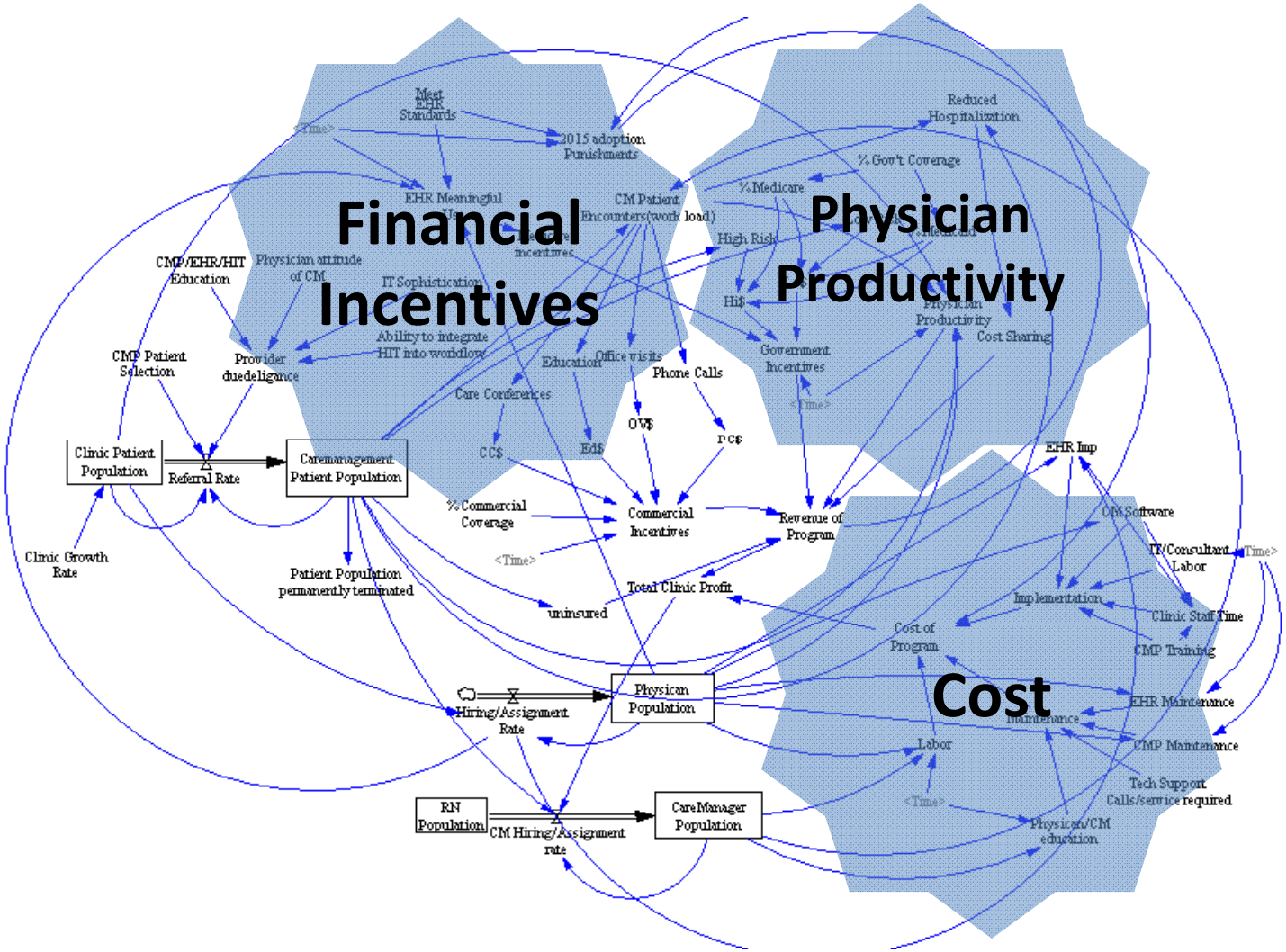
Stock & Flow Model



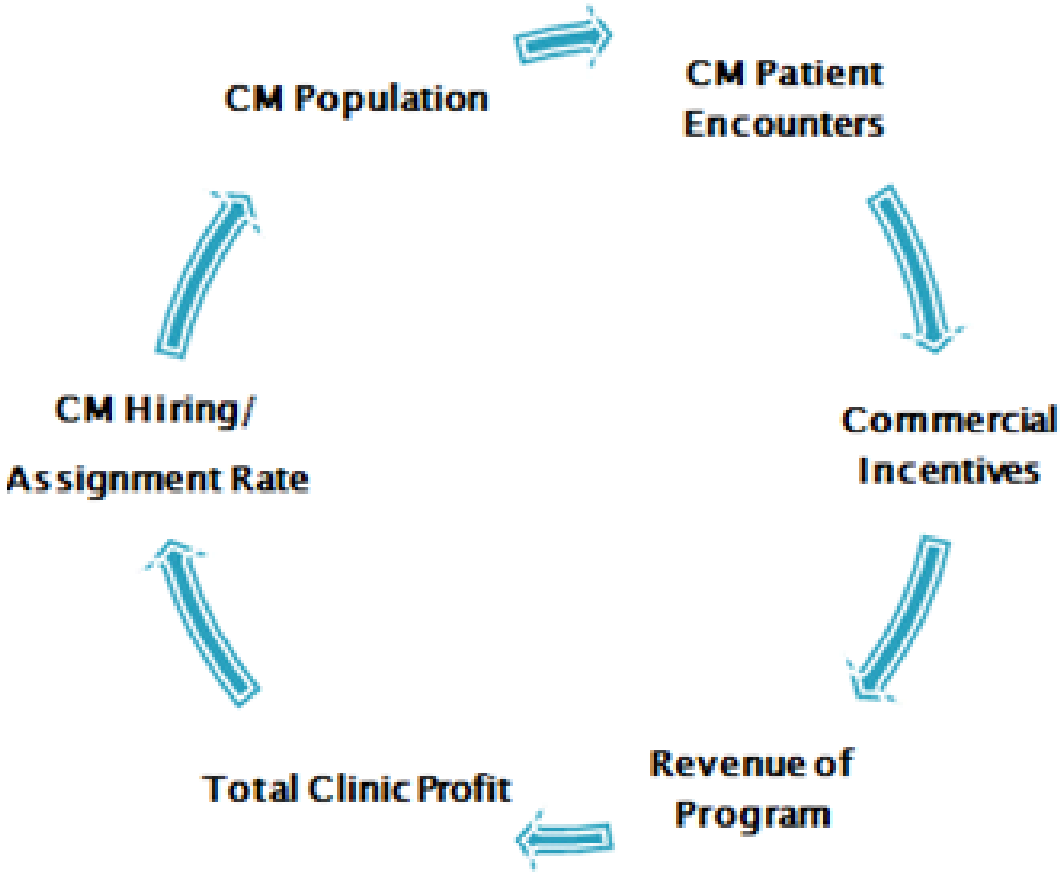
Stock


Clinic Patient Population
Referral Rate
Caremanagement Patient Population
Hiring/Assignment Rate
Physican Population
RN Population
CM Hiring/Assignment rate
CareManager Population

Positive Feedback Loops



Incentives Positive Feedback Loop

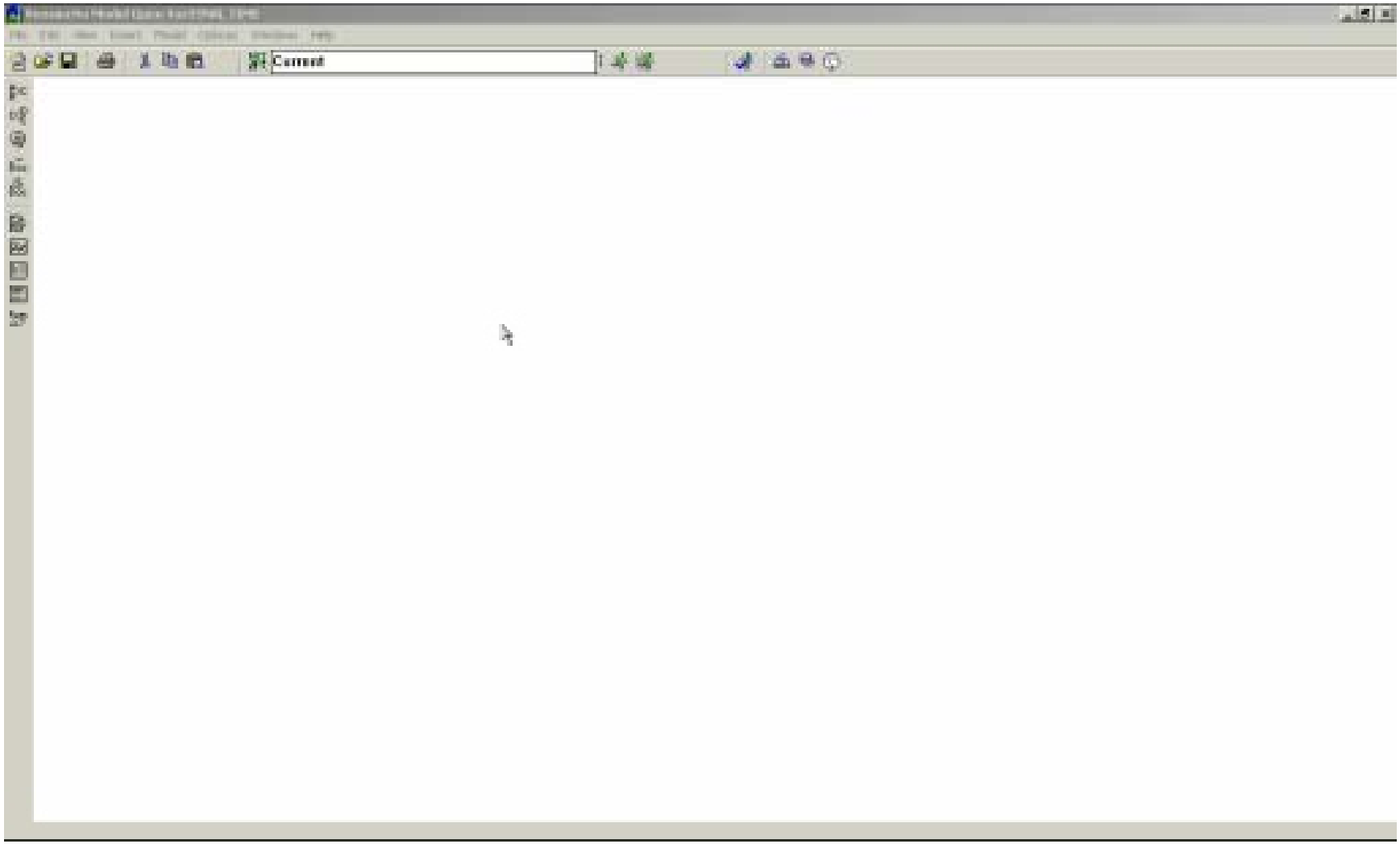


System Dynamics Modeling Tool

demo

(VenSim™)

System Dynamics Modeling Tool demo (VenSimTM)



Scenario Analysis

Scenarios by Clinic Type

Clinic Type	# of Physicians # of CareManagers # of Patients	Payer Mix
Small Rural Private Practice	2 1 4600	Government: 53% Private: 47%
Medium Private Practice	5 1 11,500	Government: 20% Private: 80%
Safety Net Clinic	5 1 11,500	Government: 80% Private: 20%

Model Constants

Variable	Unit	Equation	Base, Range	Source	Details
Productivity	Adjusted wRVUs		379.3 (379.3, 412.2)	AJMC	Low use = 388.8, High use = 412.2, w/o = 379.3
Program Costs	$	36$/wRVU * Productivity		(http://www.bls.gov/)	Median wages RN - benefits 31% of total salary Overhead (computers, space, electricity, and other support) was calculated at 25% of the total costs
Population CM sees	percent		2.5% (0,2)=low(2,>)=high		A measure of how many patients CM sees 2.5% is average wit
Physician Population	Number				
CM Population	Number				
EHR implementation costs	$	$32606*number physicians	$32606 ($37204 small clinic)	http://www.ahrq.gov/r	Average per physician. Highest for smaller practices
EHR maintenance costs	$	$1500pmpm * n*months	$1,500	" "	
CM Software	$	$20k/physician/year*n*t	$20k	Dave Dorr	Is this just an estimate? Only CMP software?
CM	$	$90k/CM/year*n*t	$90k	Dave Dorr	How to deal with time issue?
EHR Hardware	$	$6863/physician/year*n*t	$6,863	http://www.centerforh	Based on 3 physician practice over 3 years. WAS TOTAL FOR 3.
EHR Training	$	$1007/phys/year*n*t	$1,007	http://www.centerforh	same
EHR Support costs	$	$1244/phys/yr*n*t	$1,244	http://www.centerforh	same - doesn't include CMP
EHR Annual costs after 1 year	$	$1094/phys/yr*n*t	$1,094	http://www.centerforh	same
Reduced Hospitalization	% hospitslized		23.30%	Death hosp JAGS	1 year CMP 22.2% vs 23.3% cntrl 2 year CMP 30.5% vs 39.2% cn
ED Visits	% ED visits				1 year no difference; 2 years 1.28 OR - increased ED visit p=0.0
IT Sophistication					
CMP Maturity	Number 0-4	Assign number based on sca	2? Implement CM business prc	Informs 0910 ppt	Use as a scalar
Providers work satisfaction	percent		88.9% satisfaction (Very)	Disease Mgmt paper	
Community connection	percent		46.9% referral rate	Disease Mgmt paper	
Ability to integrate HIT workflow	percent		94.4% accessed EHR for patient	Disease Mgmt paper	54 physicians accessed EHR 18,486/19,582 patients seen
CM patient encounters	number	4.3 (+/-)* no. patients * t	4.3 +/- 3.9 encounters/patient	Disease Mgmt paper	For incentives - of total patients encounters: face-to-face visi
Physician workload	hours/1000 patients			Physician Perspectives	Need to figure out how to go from hours/week/1000 patients
CM proximity	percent	Observable	higher percent for closer	Physician Perspectives	Correlation between physician workload and problem of CM
Incentives				http://www.familydocs.org/practice-resources/ehr-adoption-fact-sheet.php	
Capital Expenditure	$	Hardware+EHR+CM Software			

Levels of Quality

- **High (Effective):** 40 patient referrals/month to CMP-meets meaningful use measures.
- **Medium (Average):** 30 patient referrals/month to CMP-meets meaningful use measures.
- **Low (Poor):** 20 patient referrals/month to CMP –does not meet meaningful user measures.

Revenue = (Patient Population Growth + Physician Productivity) – (Implementation + Ongoing Cost)

Simulation Results

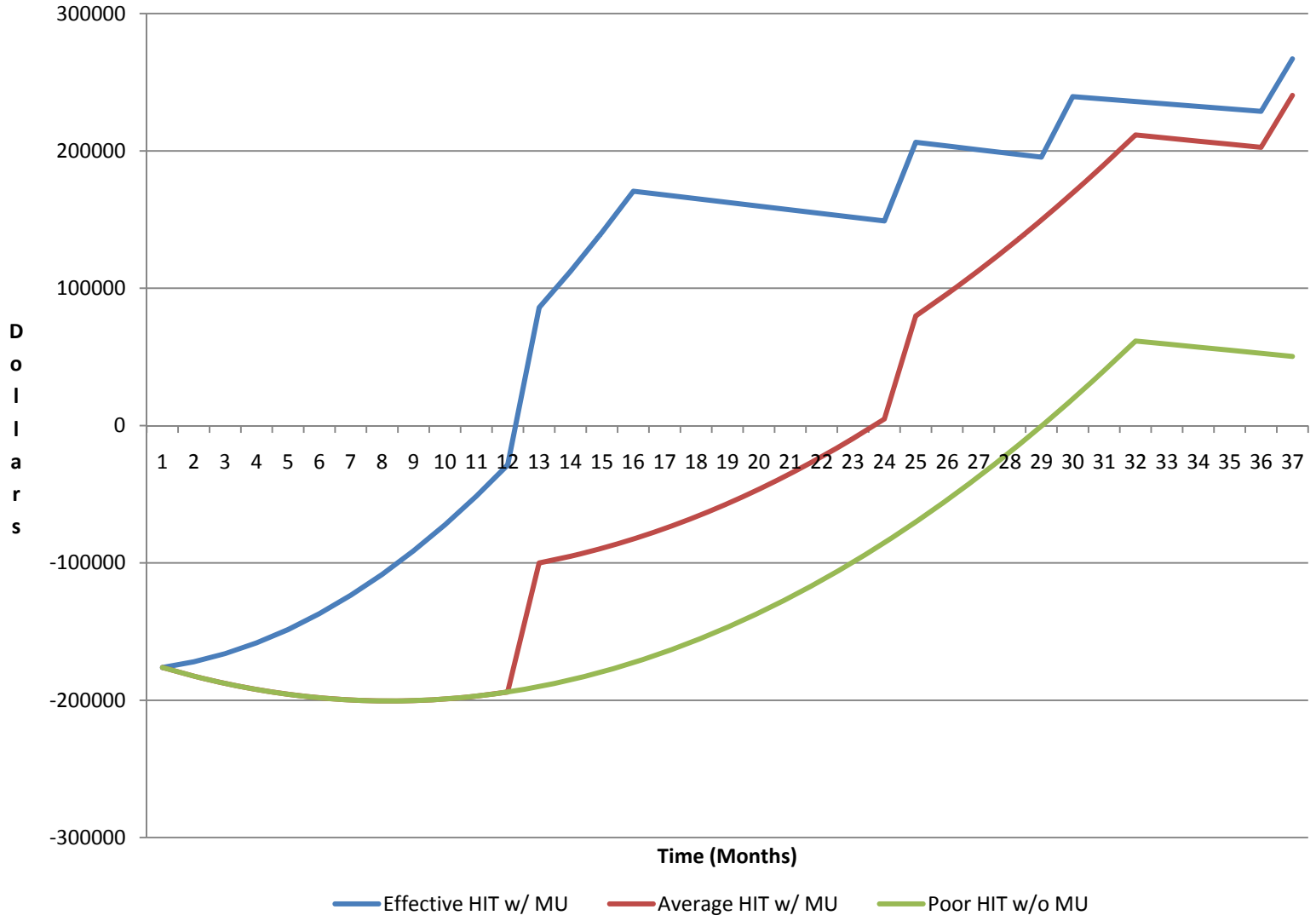
Levels of Quality

Clinic Type	New Clinic Revenue	Societal Savings ($)
Small Rural Private Practice	-$76,776	$163,200 – $420,750
Medium Private Practice	$267,004	$409,600 – $1,056,000
Safety Net Clinic	$178,712	$409,600 – $1,056,000

1. Dorr, David A., *The Effect of Technology-Supported, Multidisease Care Management on the Mortality and Hospitalization of Seniors.* JAGS 2008; 56: 2199.

** Societal savings based on $640-$1,650 per patient per year savings*

Clinic Revenue with CMP



Discussion & Conclusion

Discussion

- Meeting EHR meaningful use standards is critical to offset implementation costs of EHR and CMP HIT
  - Meaningful EHR users and effective HIT users recover implementation costs quickest
- Average users of HIT generally come close to achieving the same revenue gain due to CMP as effective users
  - Mainly just a difference in how long it takes to get there

Discussion

- Given current plans for reimbursement and the meaningful use reimbursement policy, medium private practices seem to work best
  - Implementation of CMP in small rural clinics is different to larger more urban clinics
- If Medicaid increases their payment for high risk patients, clinics will see more return through CMP

Limitations

- Model is based on estimates – since CMP is currently offered for free, software costs and implementation costs are hard to estimate

Hypothesis

H1: The more a Physician or a Nurse Care Manager is aware of EHR benefits, the higher the likelihood of adoption.

H2: The level and quality of “meaningful use” implemented by the clinic; low, medium or high will affect likelihood of successful adoption.

H3: Presence of Financial incentives will positively influence the use of HIT in hospitals and physicians offices.

Conclusion

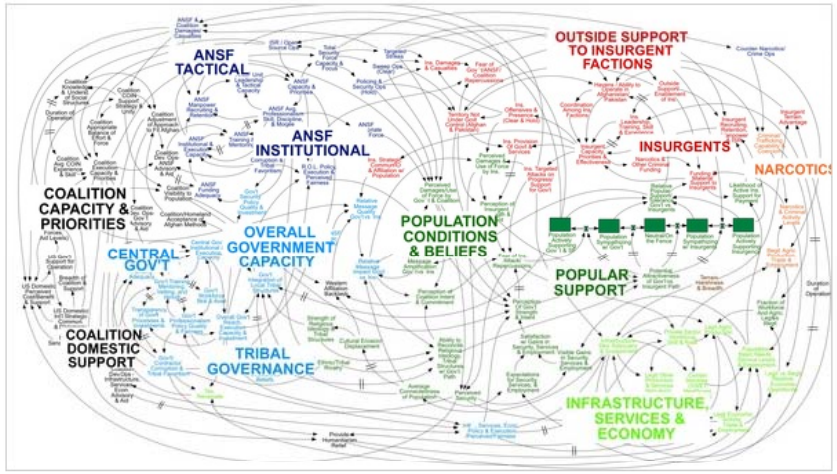
- Currently CMP is offered to clinics for free so the model helps predict how funding and reimbursement policies will affect clinic revenue when they will need to pay for it.

- Recognize differences between clinics, realize importance of HIT use, and meeting meaningful use measures

- Mutual cost-benefit for society and clinics
  - Clinics paid to keep patients out of hospital; society saves money

Power-Point is the Enemy

We Have Met the Enemy and He Is PowerPoint



A PowerPoint diagram meant to portray the complexity of American strategy in Afghanistan certainly succeeded in that aim.

By ELISABETH BUMILLER
Published: April 26, 2010

WASHINGTON — Gen. Stanley A. McChrystal, the leader of American and NATO forces in Afghanistan, was shown a PowerPoint

CMP Team:

Oregon:

Dr. David Dorr (PI)
Nima Behkami
Kelli Radican
Gwen Olsen
Molly King
Marsha
Marsha Pierre-Jacques Williams
Kristin Dahlgren
Susan Butterworth
Carlo Pearson
Doug Rhoton

Utah:

Dr. Cherie Brunker (PI)
Liza Widmier
Mary Carpenter

Backup Slides

Medium Private Practice Clinic

Constants:

- 5 physicians; 1 CM; 2300 patients / physician
- 80% commercial coverage
- 20% Government (Medicare)
- Reduced Hospitalization stays constant as long as CMP in place. (-4.7% in hospitalizations)
    - --Society saves $10548 per avoided hospitalization –this now goes to clinic revenue as a reimbursement.
- EHR implementation: $32606 / physician one-time cost - just an estimate – problem of no memory of model. Cost / physician goes up every time a physician is hired.
- CMP implementation: $8152 / physician
- EHR maintnenance: $1500 pmpm
- CMP maintenance: $375 pmpm
- IT / Consultant labor: $60,000 / year salary. This is across about six clinics which comes to $833.33 / clinic / month
- $t(0) = \ Jan. 2011\ t = (0,72)$ in months (6 years total)

Scenario Number 1:

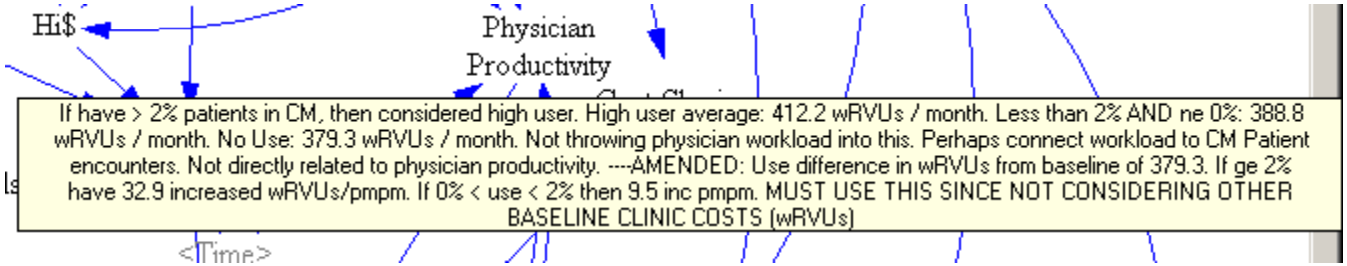
- Clinic Growth Rate: 40/month
- Referral Rate: Full count --- 40/month max make it to CM Patient Pop'n
- Meets EHR Meaningful use standards – does not get 2015 punishments – equates to $44,000 / physician over 5 years. No punishment reduction
- Commercial Incentives:
  Care Conferences: $75, 9.9%; Education: $30, 16.4%; Office Visits: $60, 33.5%; Phone Calls: $15, 40.2%
- Government Incentives:
  $100 / high risk patient / month (48%); $25 low risk pmpm (52%)

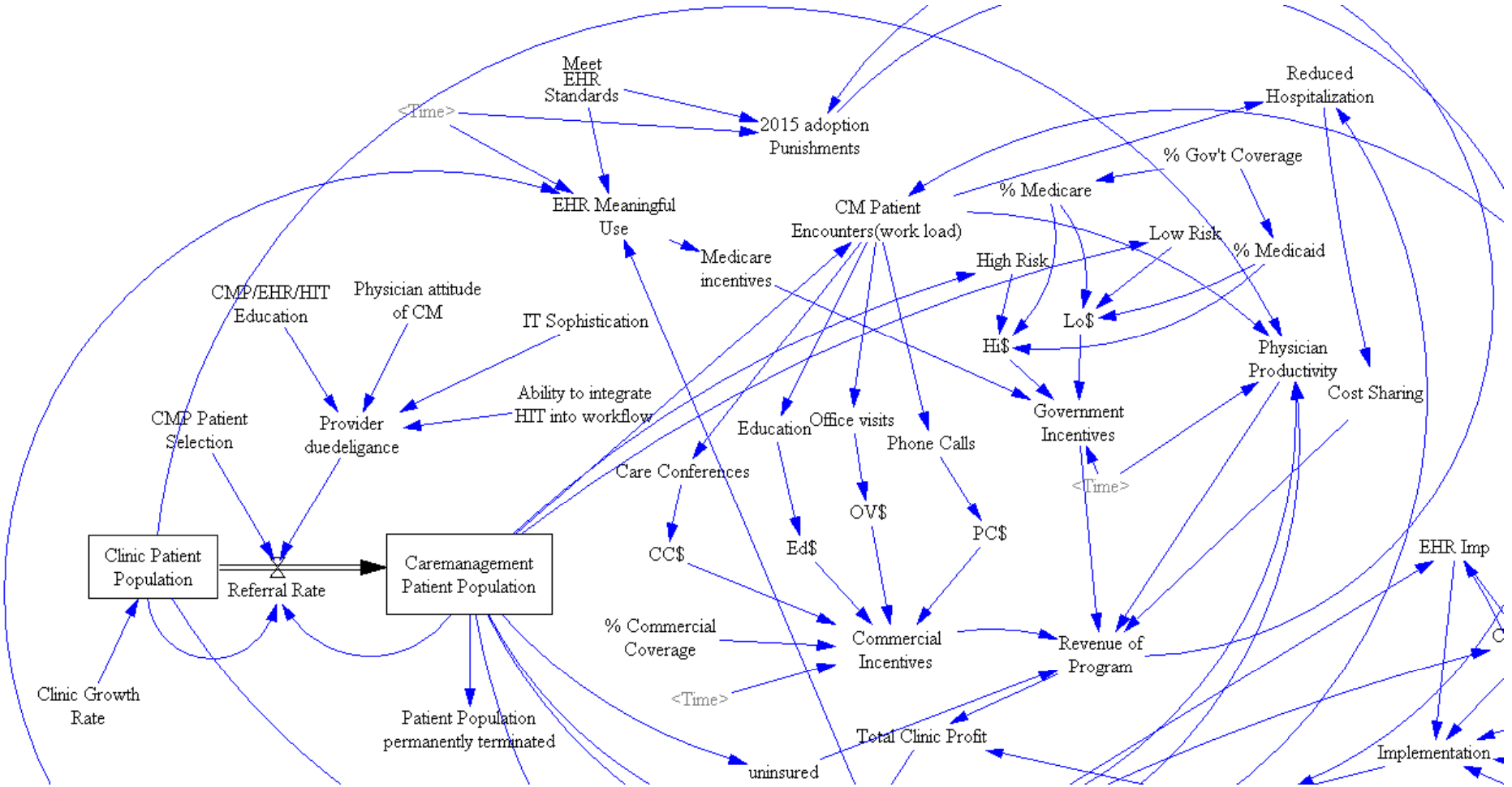
Scenario Number 2:

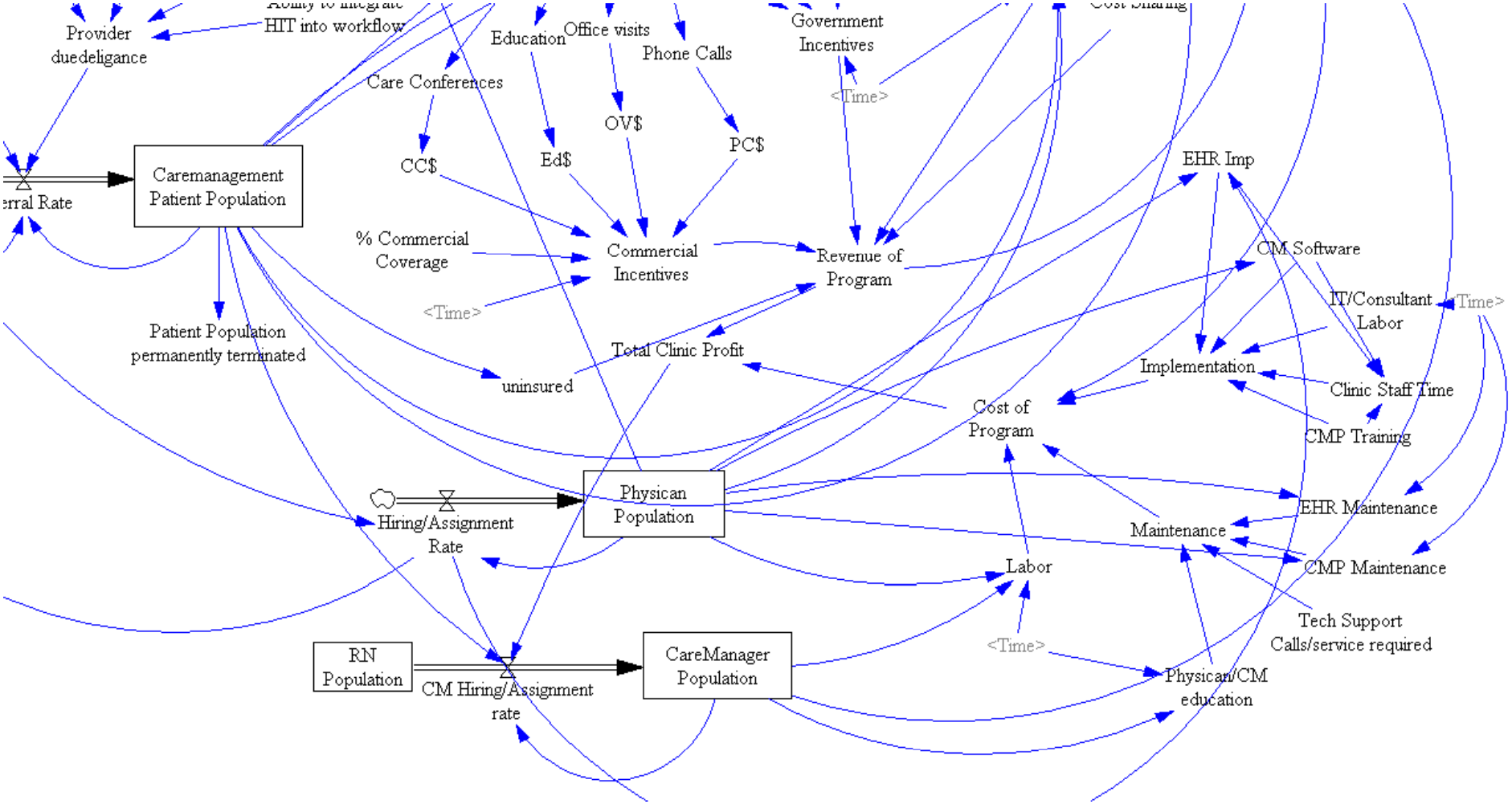
- Clinic Growth Rate: 40
- Referral Rate: 20 -- Maybe slacking in 'patient selection' and poor attitude of CM, can't integrate it well, and uneducated about CMP/EHR
- Doesn't meet EHR meaningful use standards – gets punished starting 2015. Loses out on $44,000 bonus and gets penalized 1% revenue starting 2015, 2% 2016,....
- Commercial Incentives:
  Care Conferences: $75, 9.9%; Education: $30, 16.4%; Office Visits: $60, 33.5%; Phone Calls: $15, 40.2%
- Government Incentives:
  $100 / high risk patient / month (48%); $25 low risk pmpm (52%)

Summary Overview of Meaningful Use Objectives.*

Objective	Measure
Core set†	
Record patient demographics (sex, race, ethnicity, date of birth, preferred language, and in the case of hospitals, date and preliminary cause of death in the event of mortality)	More than 50% of patients' demographic data recorded as structured data
Record vital signs and chart changes (height, weight, blood pressure, body-mass index, growth charts for children)	More than 50% of patients 2 years of age or older have height, weight, and blood pressure recorded as structured data
Maintain up-to-date problem list of current and active diagnoses	More than 80% of patients have at least one entry recorded as structured data
Maintain active medication list	More than 80% of patients have at least one entry recorded as structured data
Maintain active medication allergy list	More than 80% of patients have at least one entry recorded as structured data
Record smoking status for patients 13 years of age or older	More than 50% of patients 13 years of age or older have smoking status recorded as structured data
For individual professionals, provide patients with clinical summaries for each office visit; for hospitals, provide an electronic copy of hospital discharge instructions on request	Clinical summaries provided to patients for more than 50% of all office visits within 3 business days; more than 50% of all patients who are discharged from the inpatient department or emergency department of an eligible hospital or critical access hospital and who request an electronic copy of their discharge instructions are provided with it
On request, provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, medication allergies, and for hospitals, discharge summary and procedures)	More than 50% of requesting patients receive electronic copy within 3 business days
Generate and transmit permissible prescriptions electronically (does not apply to hospitals)	More than 40% are transmitted electronically using certified EHR technology
Computer provider order entry (CPOE) for medication orders	More than 30% of patients with at least one medication in their medication list have at least one medication ordered through CPOE
Implement drug–drug and drug–allergy interaction checks	Functionality is enabled for these checks for the entire reporting period
Implement capability to electronically exchange key clinical information among providers and patient-authorized entities	Perform at least one test of EHR's capacity to electronically exchange information
Implement one clinical decision support rule and ability to track compliance with the rule	One clinical decision support rule implemented
Implement systems to protect privacy and security of patient data in the EHR	Conduct or review a security risk analysis, implement security updates as necessary, and correct identified security deficiencies
Report clinical quality measures to CMS or states	For 2011, provide aggregate numerator and denominator through attestation; for 2012, electronically submit measures
Menu set‡	
Implement drug formulary checks	Drug formulary check system is implemented and has access to at least one internal or external drug formulary for the entire reporting period
Incorporate clinical laboratory test results into EHRs as structured data	More than 40% of clinical laboratory test results whose results are in positive/negative or numerical format are incorporated into EHRs as structured data
Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach	Generate at least one listing of patients with a specific condition
Use EHR technology to identify patient-specific education resources and provide those to the patient as appropriate	More than 10% of patients are provided patient-specific education resources
Perform medication reconciliation between care settings	Medication reconciliation is performed for more than 50% of transitions of care


Hi$
Physician
Productivity
If have > 2% patients in CM, then considered high user. High user average: 412.2 wRVUs / month. Less than 2% AND ne 0%: 388.8 wRVUs / month. No Use: 379.3 wRVUs / month. Not throwing physician workload into this. Perhaps connect workload to CM Patient encounters. Not directly related to physician productivity. ----AMENDED: Use difference in wRVUs from baseline of 379.3. If ge 2% have 32.9 increased wRVUs/pmpm. If 0% < use < 2% then 9.5 inc pmpm. MUST USE THIS SINCE NOT CONSIDERING OTHER BASELINE CLINIC COSTS (wRVUs)
<Time>


Meet EHR Standards
<Time>
2015 adoption Punishments
Reduced Hospitalization
% Gov't Coverage
% Medicare
EHR Meaningful Use
CM Patient Encounters(work load)
Low Risk
% Medicaid
Medicare incentives
High Risk
CMP/EHR/HIT Education
Physician attitude of CM
IT Sophistication
Lo$
Hi$
Physician Productivity
Cost Sharing
Ability to integrate HIT into workflow
CMP Patient Selection
Provider duedeligance
Education
Office visits
Phone Calls
Government Incentives
<Time>
Care Conferences
OV$
CC$
Ed$
PC$
EHR Imp
Clinic Patient Population
Referral Rate
Caremanagement Patient Population
% Commercial Coverage
Commercial Incentives
Revenue of Program
Clinic Growth Rate
<Time>
Patient Population permanently terminated
Total Clinic Profit
Implementation
uninsured


Provider duedeligance
HIT into workflow
Education
Office visits
Phone Calls
Government Incentives
Care Conferences
<Time>
OV$
CC$
Ed$
PC$
Caremanagement Patient Population
EHR Imp
% Commercial Coverage
Commercial Incentives
Revenue of Program
CM Software
<Time>
IT/Consultant Labor
<Time>
Patient Population permanently terminated
Total Clinic Profit
uninsured
Implementation
Clinic Staff Time
Cost of Program
CMP Training
Physican Population
EHR Maintenance
Hiring/Assignment Rate
Maintenance
Labor
CMP Maintenance
Tech Support Calls/service required
RN Population
CM Hiring/Assignment rate
CareManager Population
<Time>
Physican/CM education

Model Assumptions

- Clinic growth rate is positive
- Other clinic costs are held constant
  - Model starts in 2011 (t=0 in Jan. 2011)
- Commercial and government incentive rates are fixed
  - Government - $25 pmpm for low risk; $100 pmpm high risk
  - Commercial - care conference ($75); education session ($30); office visit ($60); phone call($15)

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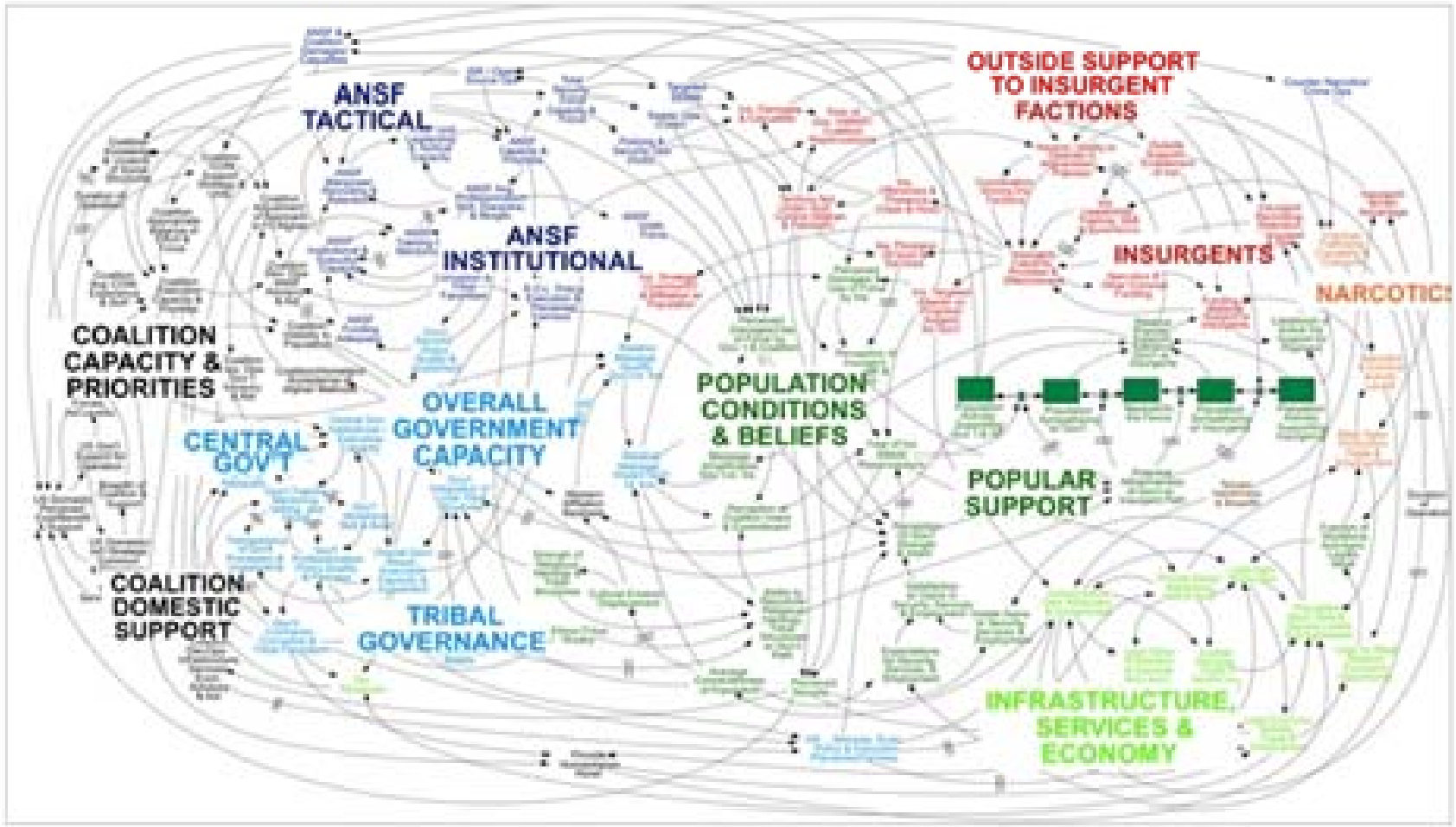

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