5th HEPATITIS C TECHNICAL ADVISORY GROUP

TAG Meeting

COST- EFFECTIVENESS OF THE HCV TREATMENT PROGRAM IN GEORGIA

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What is cost-effectiveness analysis?

The cost of HCV screening, treatment and care under the elimination program compared to no elimination program

Costs

Outcomes

=

Incremental cost-effectiveness ratio (ICER)

Cost per QALY gained by the elimination program

Quality adjusted life years (QALY) in the population under the elimination program compared to no elimination program

1 QALY represents a year of life in perfect health

How do we decide what is cost-effective?

- Cost/QALY – how much is the government willing to pay (WTP) for a year of healthy life?
  - Paying for a new intervention should not mean we can no longer afford other effective interventions
- Standard WTP threshold is GDP per capita
  - $3,765 for Georgia in 2015
  - Opportunity cost threshold ~ 20-27% GDP ($743-$1,044)[1]

1. Ochalek *BMJ Global Health* 2018.

Background for this analysis

- Hepatitis C treatment within Georgia's elimination program began in April 2015
- Initially, treatments were offered to patients with cirrhosis/advanced liver disease, opened up to all patients in June 2016
- From the end of 2017, core antigen testing was introduced, and patient co-payment for confirmation testing was eliminated
- Evaluated the program up to introduction of core antigen

Scope of this analysis

- Cost-effectiveness of HCV screening and treatment from April 2015 to November 2017…
  - Cost per QALY gained,
  - Compared to no elimination program,
  - Perspective of government [and of the patient],
  - Counting all costs and outcomes through 2030?

*Results presented are preliminary and work is ongoing

Methods: How costs were measured

Screening (NCDC, calculation from cascade of care)

Diagnostics (MoLHSA, SSA Financial Module)

Information on pharmaceutical costs (MoLHSA, Elim C)

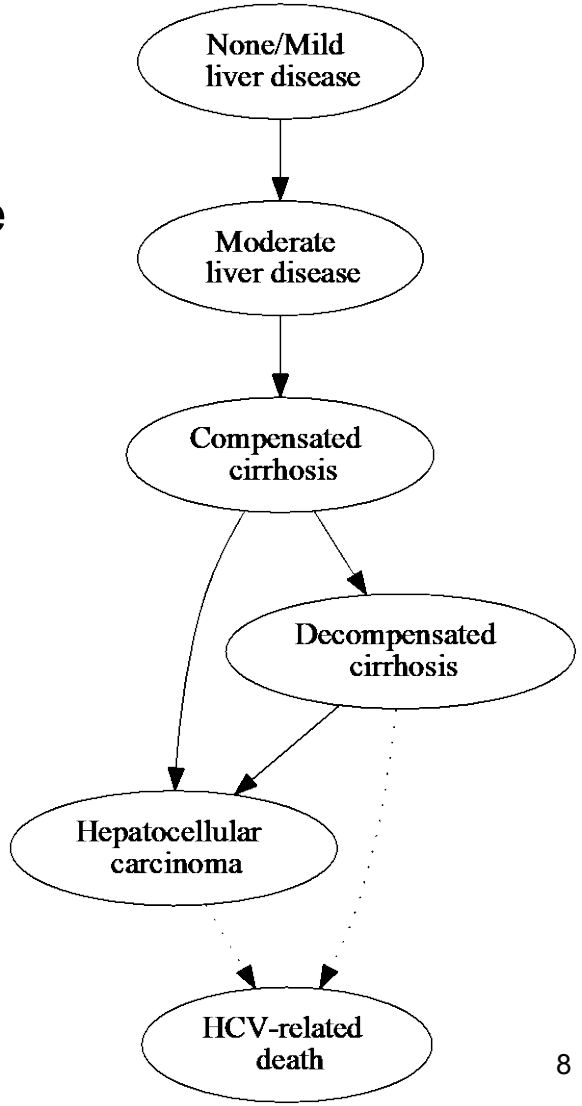
Indirect costs (NCDC, MoLHSA, Fixed strategy)

Medical costs: Management of Infectious Diseases" state program database, ICD 10 B18.2

Methods: How outcomes were measured

- HCV transmission and progression model accounting for treatments by liver disease stage
- Estimated number of patients in each liver disease category and uninfected per year 2015-2030
- QALY weights from literature applied to each category (1 = perfect health)

Disease state	QALY weight[1]
Mild	0.76 (0.68-0.83)
Moderate	0.76 (0.68-0.83)
Compensated cirrhosis	0.74 (0.66-0.83)
Decompensated Cirrhosis	0.66 (0.46-0.86)
HCC	0.65 (0.44-0.86)
SVR	0.83 (0.77-0.90)



1. Chong et al *Am. J. of Gastroenterology* 2003

Results: Cost of treatment

- Total cost of screening and treatment averaged over 41,483 patients treated

	Government	Patient
Without treatment	0	0
With treatment	**$338***	**$217****

DAA costs per patient:
- List price: $77,000
- Estimated generic: $143

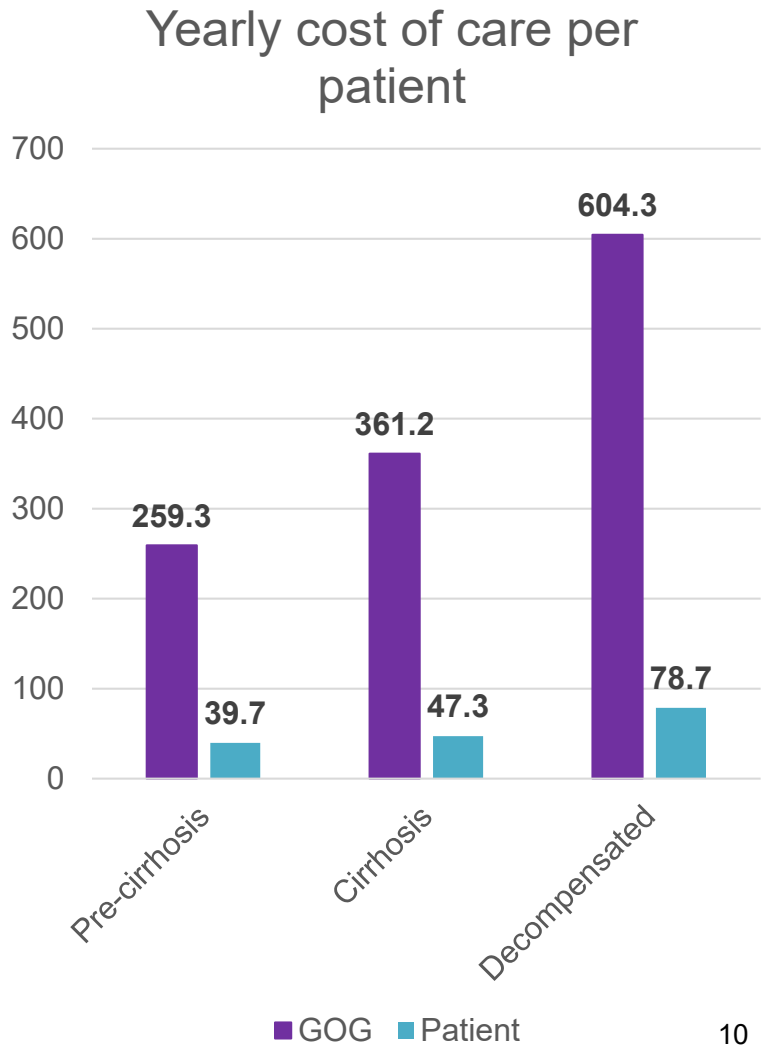
*Based on average unit costs:
- Screening test $0.5
- RNA confirmation $14
- Diagnostics $40
- Monitoring $29 (2016); $8 (2017)
- Non-DAA drugs $49 (2016); $33 (2017)

**Based on average unit costs:
- Screening test $0
- RNA confirmation $28
- Diagnostics $86 (2016); $132 (2017)
- Monitoring $76 (2016); $19 (2017)
- Non-DAA drugs $0

Results: Cost of liver disease care

Average cost per patient treated (2015-2030)

	Without treatment	With treatment
Government	$368	$275
Patient	$48	$36



- Treatment reduces cost of care for liver disease over time

Results: Impact of treatment

41,483 treatments given by November 2017 led to:

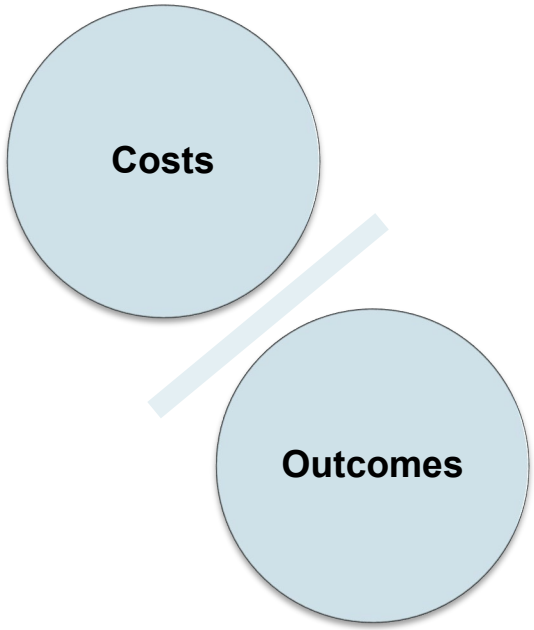
- 32,266 QALYs gained by 2030

- 100 deaths averted by November 2017
- 1,592 new infections averted by November 2017

- 2,673 deaths averted by 2030
- 16,225 new infections averted by 2030

Results: Cost-effectiveness ratios

Scenario	Cost/QALY gained (3% discounting)
Government (Gov) costs alone	$544
+ if full DAA costs paid by Gov	$155,610
+ if generic DAA costs paid by Gov	$829
+ if generic DAA costs and patient out of pocket costs paid by Gov	$1,244
+ No drug costs but Gov pay patient out of pocket costs	$959



WTP thresholds
- Low: $743
- Intermediate: $1,044
- High: $3,765

Limitations & Next steps

- Preliminary results not accounting for uncertainty in cost calculations, other sensitivity analysis to come
- QALY weights from literature for now – estimating for Georgia based on long term follow up of HCV treated patients
- Will look at cost-effectiveness within people who inject drugs separately
- Later phases of program scaled up screening, pilot projects to improve screening and linkage to care, changed confirmation testing
  - Cost-effectiveness of these stages to come in next project

Conclusions

- First phase of HCV elimination program highly cost-effective in Georgia
  - Initial treatment of cirrhosis – improved cost-effectiveness
  - Drug donation allowed lower costs to government
- Cost-effectiveness results only one part of decisions for healthcare funding
- Results useful for decision making of other countries
  - Eg., trade off between government payment and out of pocket (potential deterrent for patients)
  - How much can they pay for DAAs?
  - What case-finding or linkage to care strategies are most cost effective? [Future work]

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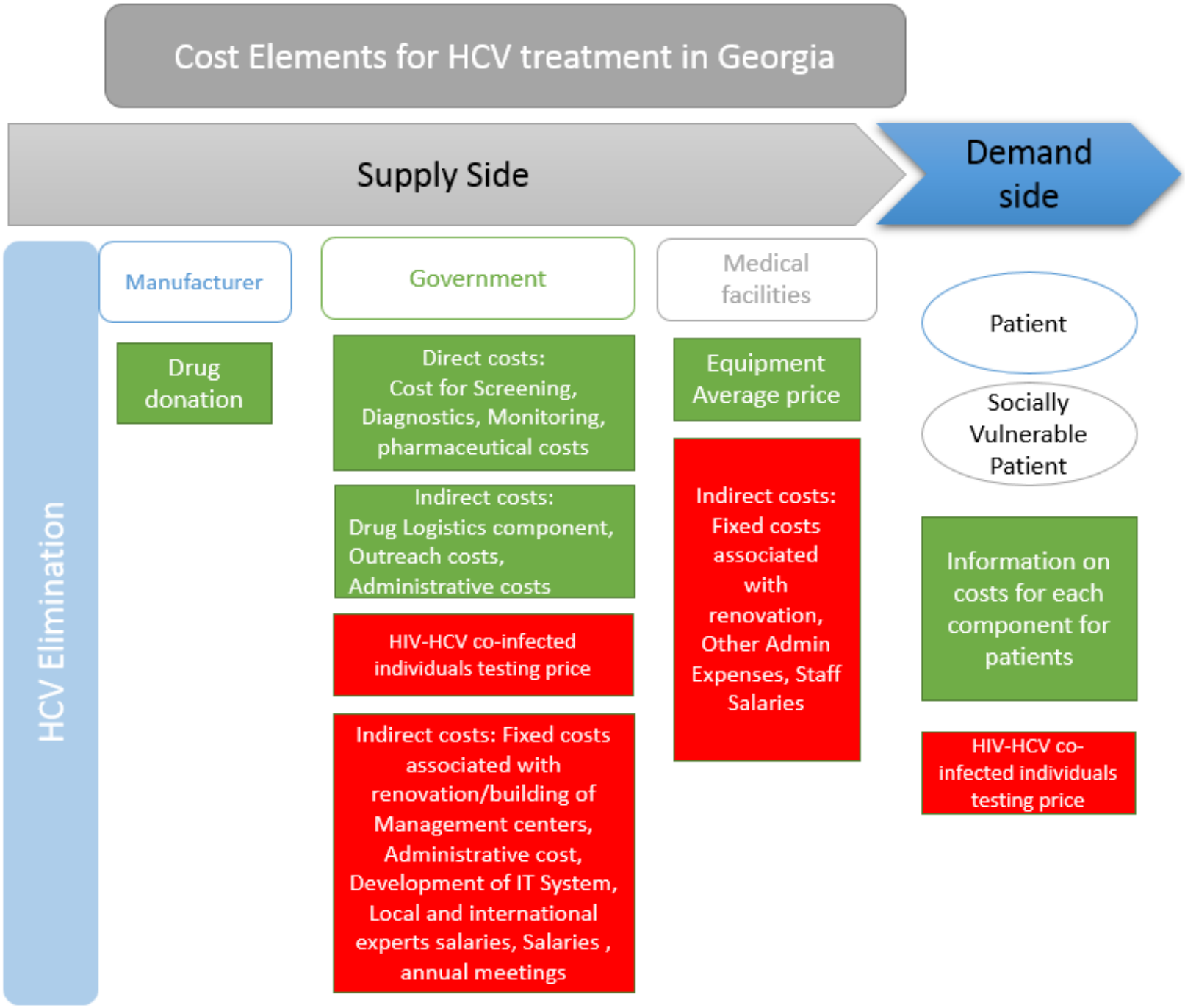
Cost Elements for HCV treatment in Georgia
Supply Side
Demand side
HCV Elimination
Manufacturer
Government
Medical facilities
Patient
Drug donation
Direct costs: Cost for Screening, Diagnostics, Monitoring, pharmaceutical costs
Equipment Average price
Socially Vulnerable Patient
Indirect costs: Drug Logistics component, Outreach costs, Administrative costs
Indirect costs: Fixed costs associated with renovation, Other Admin Expenses, Staff Salaries
Information on costs for each component for patients
HIV-HCV co-infected individuals testing price
HIV-HCV co-infected individuals testing price
Indirect costs: Fixed costs associated with renovation/building of Management centers, Administrative cost, Development of IT System, Local and international experts salaries, Salaries , annual meetings

Brief model methods

- Dynamic **HCV transmission and progression** model stratified by age, PWID status, infection and liver disease status
- Model calibrated to detailed data:
  - General population demography
  - 2015 National sero-survey HCV prevalence data by age and gender
  - PWID survey data on age distribution and HCV prevalence since 1997
- Incorporate scale-up of harm reduction interventions
- Model includes uncertainty in data used to parameterise and calibrate model.
- Captures evolving nature of HCV transmission and epidemic