WAR GAMING – COST EFFECTIVENESS ANALYSIS AND CENTRAL TENDERING

Mark Parker, 5th SFE SFUS Conference

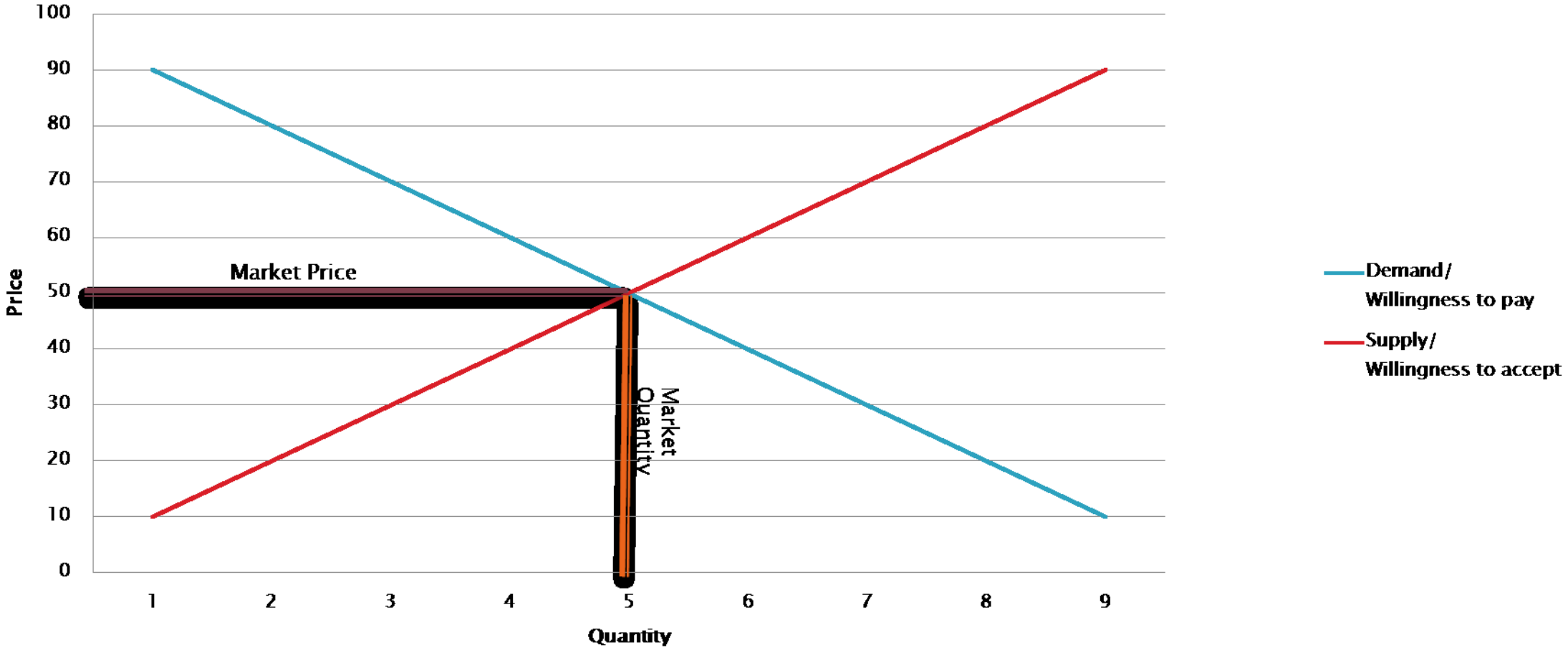
Aims and Objectives:

- Understanding the role, from a pharmaceutical manufacturer and payer perspective that BIA, CE and Central Tendering have to play to achieve the best outcome for the patient.
- Present the current “state of the art” research in estimating and validating patient outcomes along side the consequences of payer and pharmaceutical decision making.
- This workshop has been “simplified” in as many ways as possible. However it is still “complex”, this will hopefully however serve to convey that this topic is highly complex, and achieving efficient healthcare can only be achieved when we fully understand these complexities.

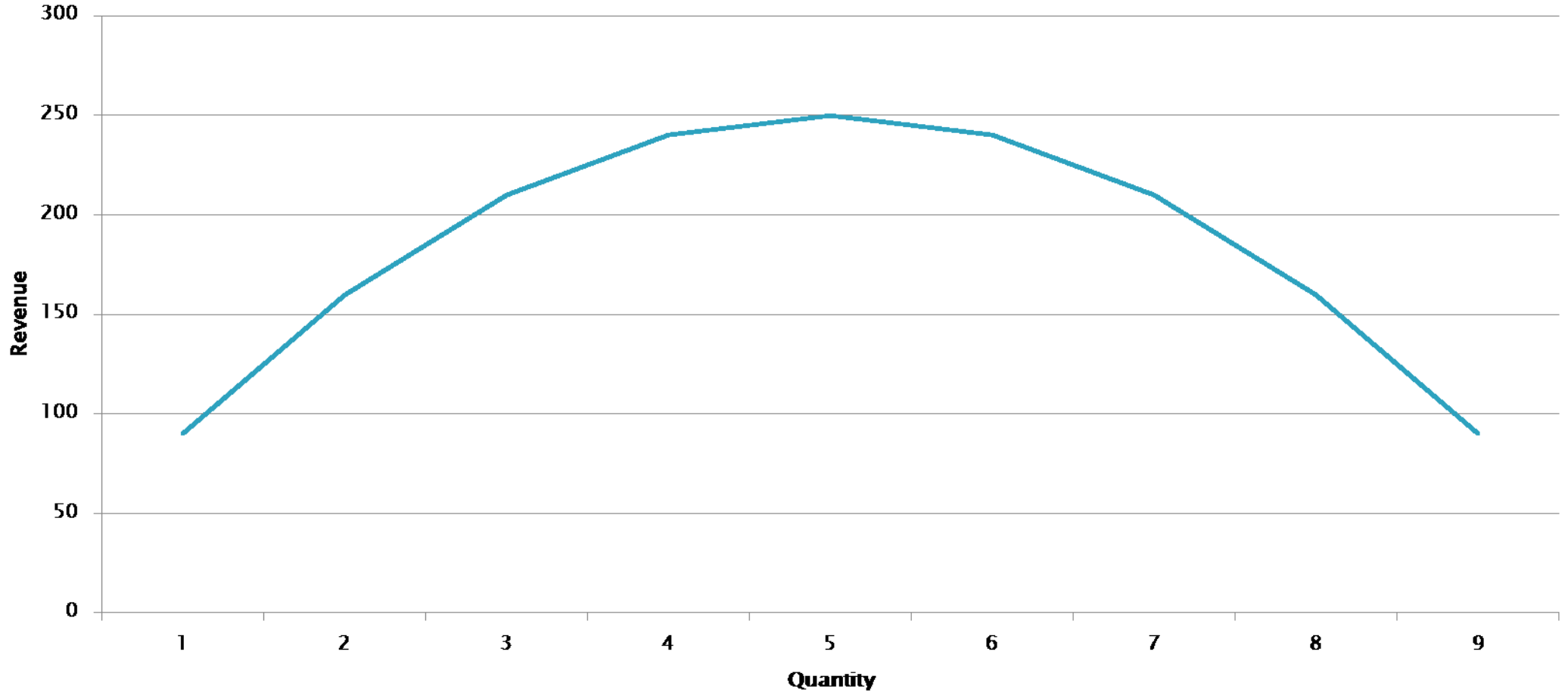
Start at the beginning: What is a Price?

- A solution to the problem of “double coincidence of wants”.
- The relative value of all things.

Start at the beginning: What is a Price?



Total Revenue



Markets: Glossary

- Monopoly:
  - 1 Seller, Many Buyers
    - Barriers To Entry – e.g. Patents

- Perfect Competition
  - Many Buyers – Many Sellers

- Oligopoly
  - Only a few sellers

- Monopsony
  - 1 Buyer – Central Tendering
    - "Buyer Power"

Републички завод за здравствено осигурање Србије

Central Tendering, Some Figures

- Pharmaceuticals: RSD90.46bn (755Mln EUR) in 2013 to RSD97.00bn (810Mln EUR) in 2014; +7.2% in local currency terms and +1.2% in US dollar terms.
- Healthcare: RSD389.82bn (USD4.53bn) in 2013 to RSD412.61bn (USD4.53bn) in 2014; +5.8% in local currency terms and -0.1% in US dollar terms.
  - http://www.sbwire.com/press-releases/new-report-available-serbia-pharmaceuticals-healthcare-report-q3-2014-529272.htm
- RFZO Financial Plans
  - Фармацеутске услуге и материјали (лекови издати на рецепт)
    - 2013: 29,731,392,000 RSD (248 Mln EUR)
    - 2014: 30,065,558,000 RSD (250 Mln EUR)
    - 2015: 26,344,020,000 RSD (220 Mln EUR)
  - Болничке услуге (секундарна и терцијарна здравствена заштита са установама ван мреже у секундарној здравственој заштити)
    - 2013: 115,106,680,000 RSD (961 Mln EUR)
    - 2014: 117,154,165,000 RSD (977 Mln EUR)
    - 2015: 109,507,992,000 RSD (913 Mln EUR)
- **Centralized Procurement of Drugs Saves Serbia 25 Million Euros**
  - **World Bank,** February 24, 2014

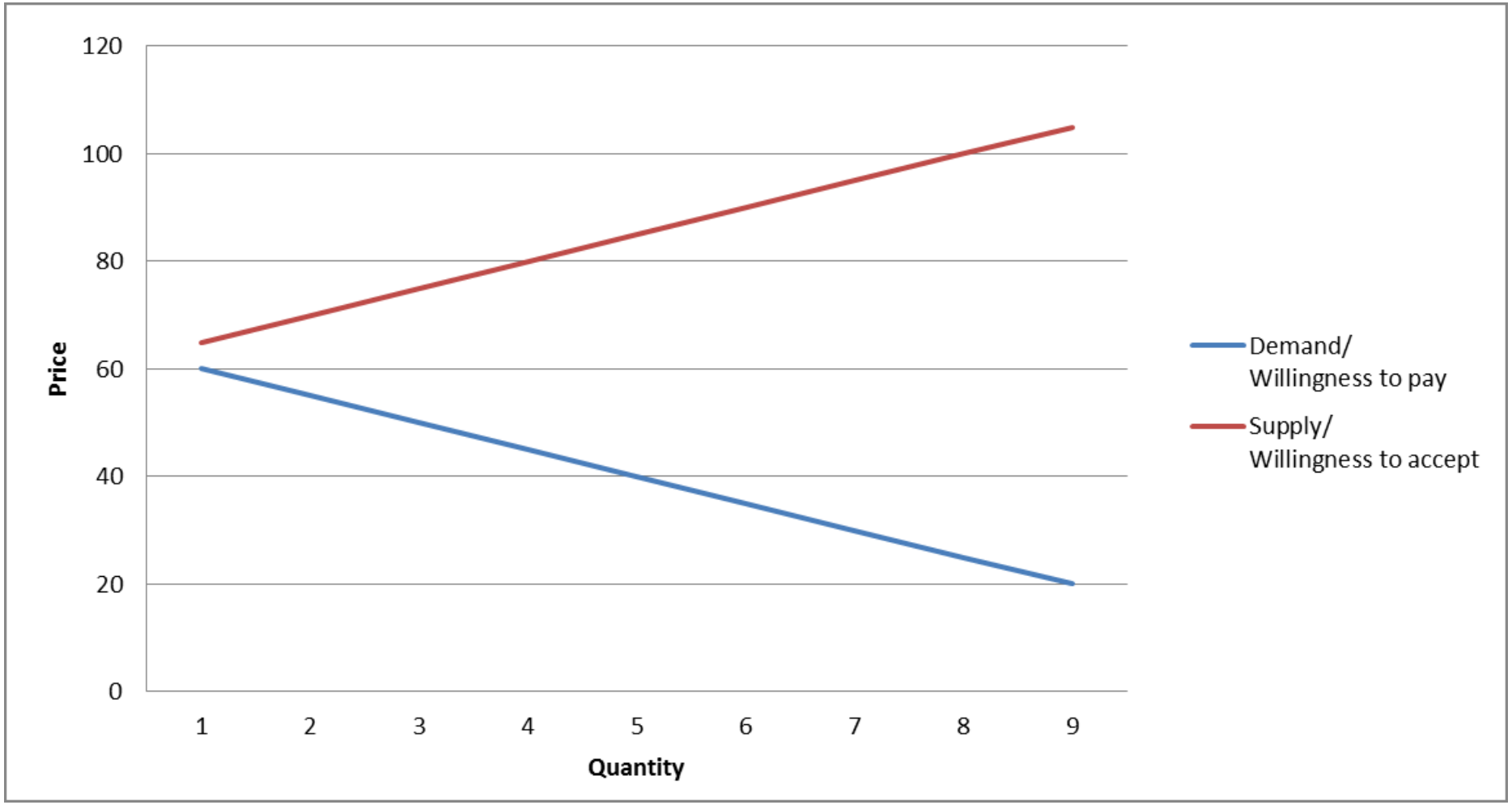
Central Tendering, Perspectives.

- " The winner is the Serbian health care system. More money is left for the beneficiaries of that system.
  - **Slavica Djukic Dejanovic,** Minister of Health
- The prices achieved were, on average, 27% lower for the same drugs. We are very proud that there were no complaints from any of the bidders.
  - **Marija Mitic,** Executive Director for public procurement, Serbian Health Insurance Fund
- The success of the first tender gives us confidence we can do more.
  - **Momcilo Babic,** Director, Serbian Health Insurance Fund

- No bidders competed for the supply of around 200 drugs (incl. different dosage forms) which were already reimbursed and readily available

- još krajem prošle godine pokrenuli proceduru za nabavku citostatika prema Zakonu o javnim nabavkama, ali da ta procedura dugo traje te je to razlog za ovu nestašicu.
- Central Tendering is the reason we have a shortage of Chemotherapy treatments
  - **Vesna Vojinović,** Director of the Central Pharmacy, Nis

The Risk -> Market Failure, No price at which buyers and sellers can exchange



Let's Practice

- First Game
  - Rheumatoid Arthritis
    - 26,000 People suffering from the disease in Serbia
    - New Biologic DMARDs Highly Clinically effective in reversing the disease.
      - Tumour necrosis factor inhibitors (adalimumab, certolizumab pegol, etanercept, golimumab, infliximab, biosimilars), abatacept, tocilizumab and, under certain circumstances, rituximab are essentially considered to have similar efficacy and safety. If the first bDMARD strategy fails, any other bDMARD may be used.[1]
  - Central Tendering Proposition
    - If Efficacy is the same – or even roughly equivalent, all we care about is the price of the drug when making a buying decision.
    - Set a budget for this class of drugs and buy "lowest bid first"
      - This Game uses a budget of €220,000 per month.
  - You are about to be given control of a company, that is manufacturing and selling a biological DMARD.
    - Your product will be "used" on an estimation of the Serbian population. The results of which will be discussed at the end of the game.

1: **EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2013 update**

Join a Game and Set your prices

- Congratulations, you are now all in possession of a pharmaceutical company producing a Biologic DMARD
  - We'll start dividing the €220,000 between us

Now Set Your Production

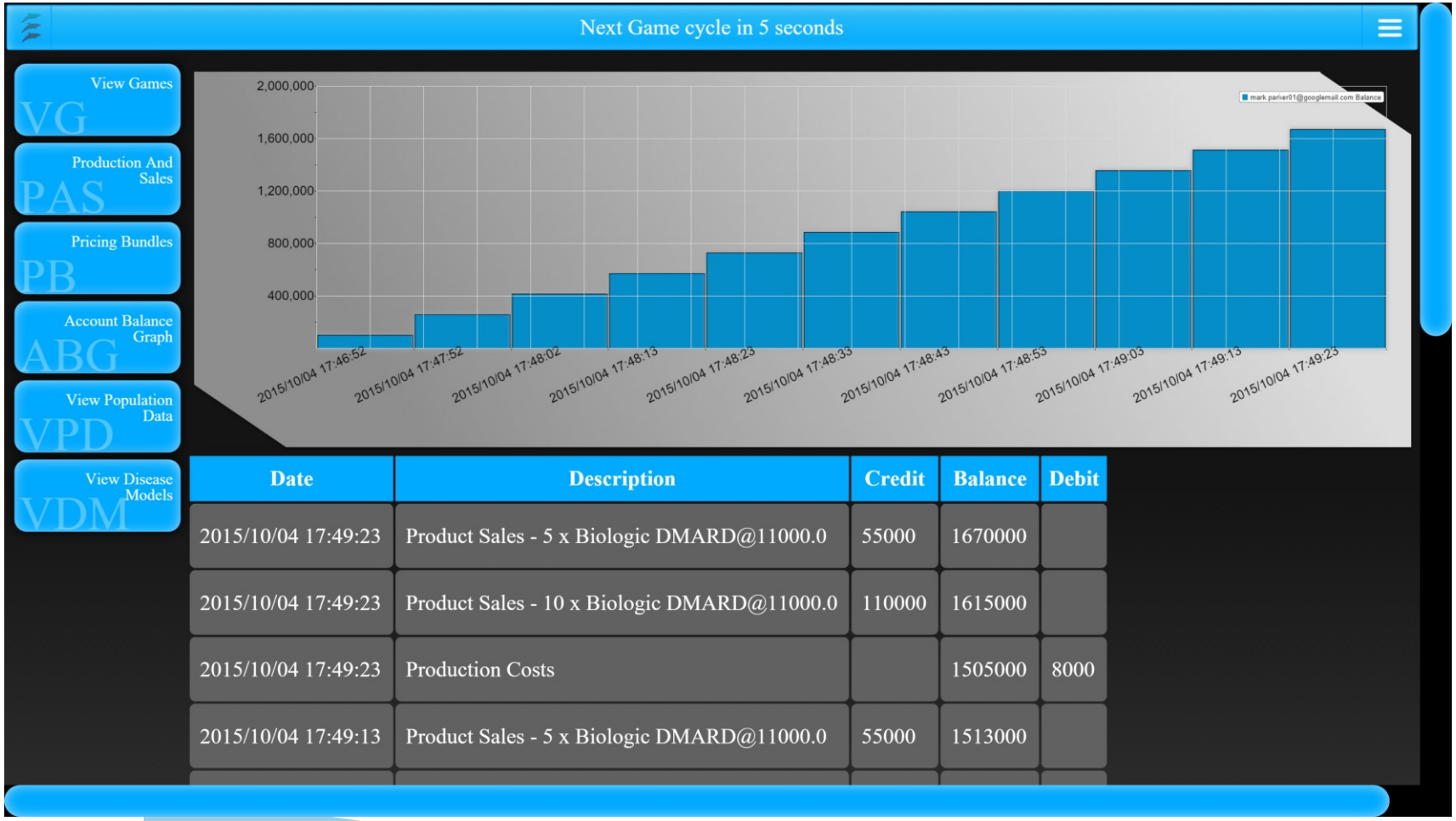
- Click “production and Sales”

- Need to keep stock to a minimum
- Sales > Production, Stock will decrease
- Production > Sales, Stock will increase

Check your companies Bank Account

- Click “Account Balance Graph”

- This shows how your companies funds change over time.
- How your sales are going (credits)
- How much it costs to run your company. (debits)

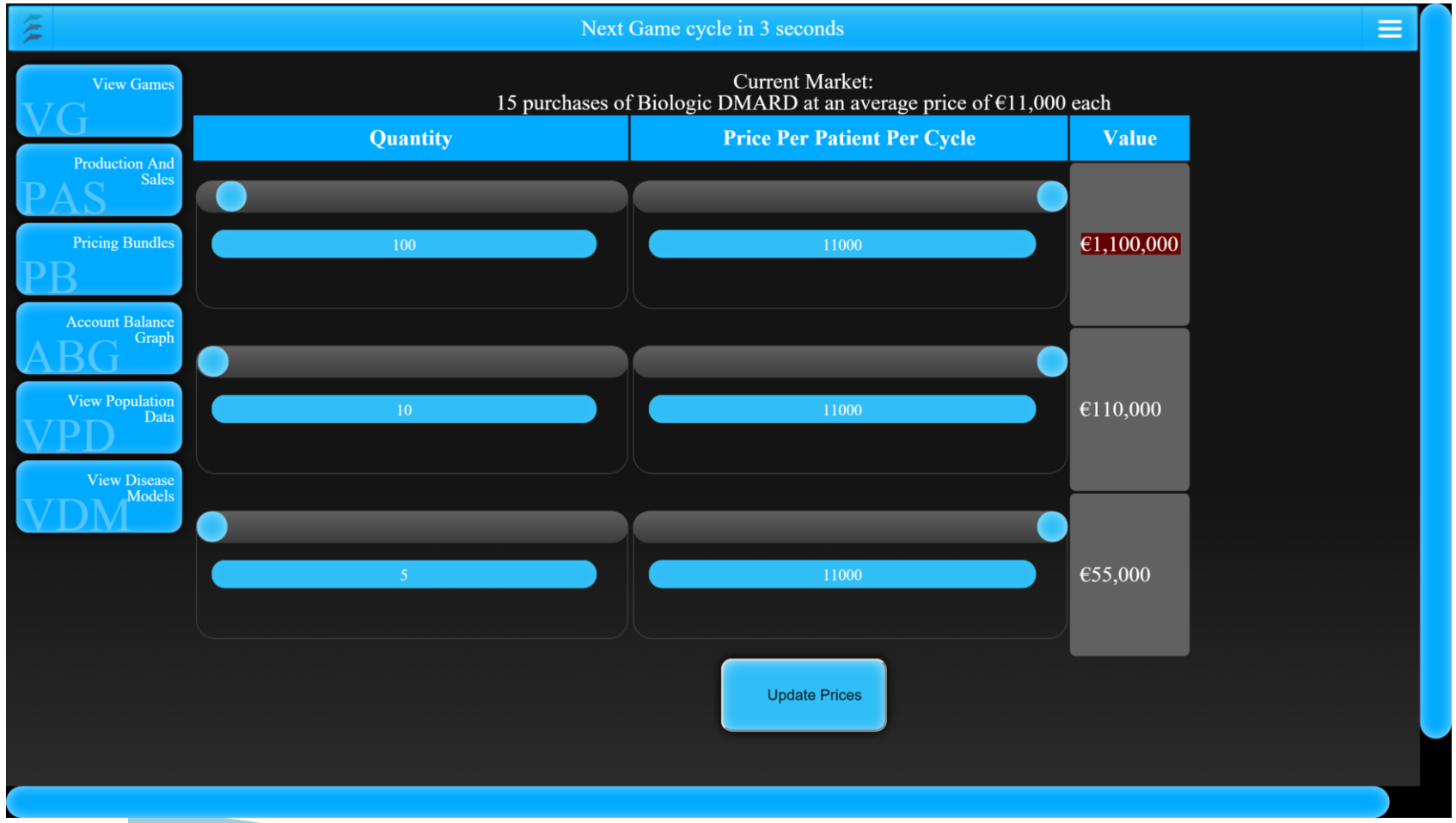


Date	Description	Credit	Balance	Debit
2015/10/04 17:49:23	Product Sales - 5 x Biologic DMARD@11000.0	55000	1670000	
2015/10/04 17:49:23	Product Sales - 10 x Biologic DMARD@11000.0	110000	1615000	
2015/10/04 17:49:23	Production Costs		1505000	8000
2015/10/04 17:49:13	Product Sales - 5 x Biologic DMARD@11000.0	55000	1513000	

Play the game, Win the Game. Largest bank balance at the end wins!

- Return to “Pricing”

- Number and average price of purchasing by central tendering is shown at the top.
- This includes your sales, and those from other companies.
- Set your quantities and price “pairs” such that your company takes the biggest (whole?) share of the €220,000 monthly budget.
- Remember you also need to control your production and stock.

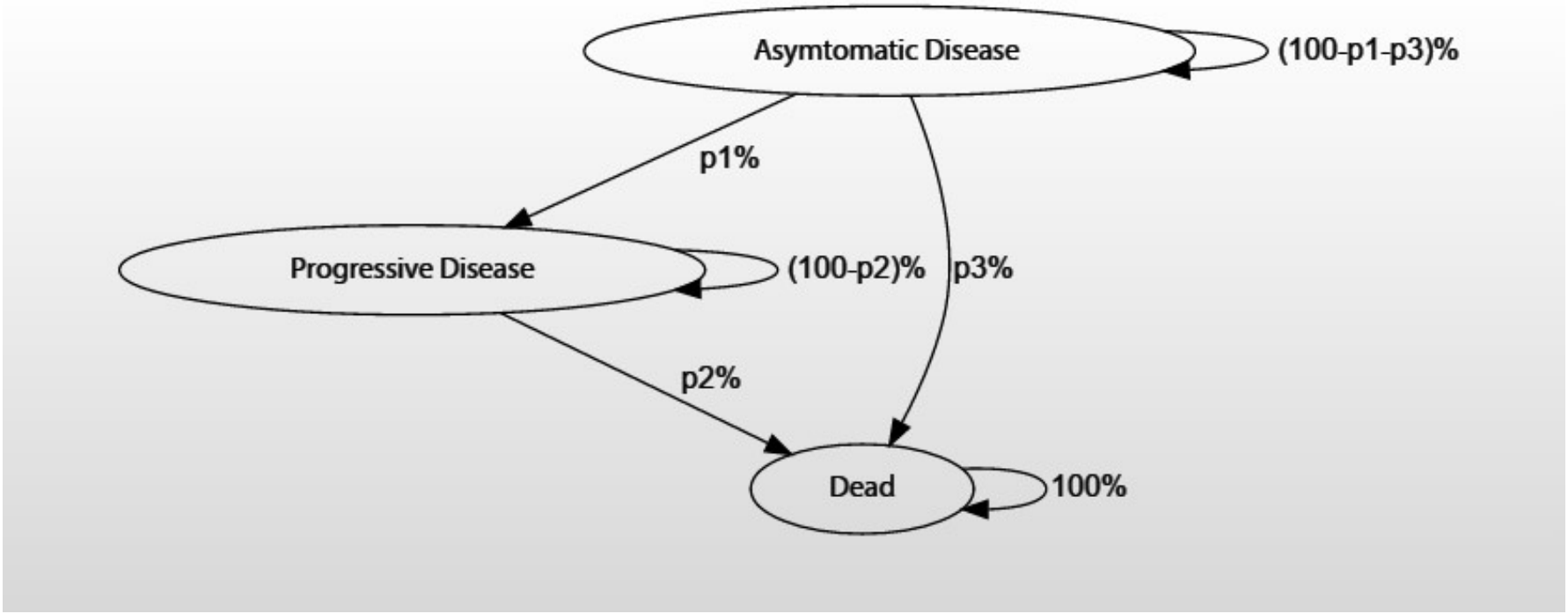


Results.

- First Game – Discussion.
  - Central Tendering
    - There are many ways this can be configured. Be that time between "accepting" price bundles (e.g. yearly "the same as" monthly, but price changes take 12 times as long, but could offer more "certainty"), the means by which bids are proposed (there are numerous types of "Auction"), or criteria for accepting bids (such as all to one company, all sellers receive "clearing" bid, or max percentage to one company)
    - Participants experiences with Central Tendering in Serbia to date.
  - How do we compare treatments with different efficacy, side effects/safety or treatment duration – or budgets across different disease areas?

1: EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2013 update

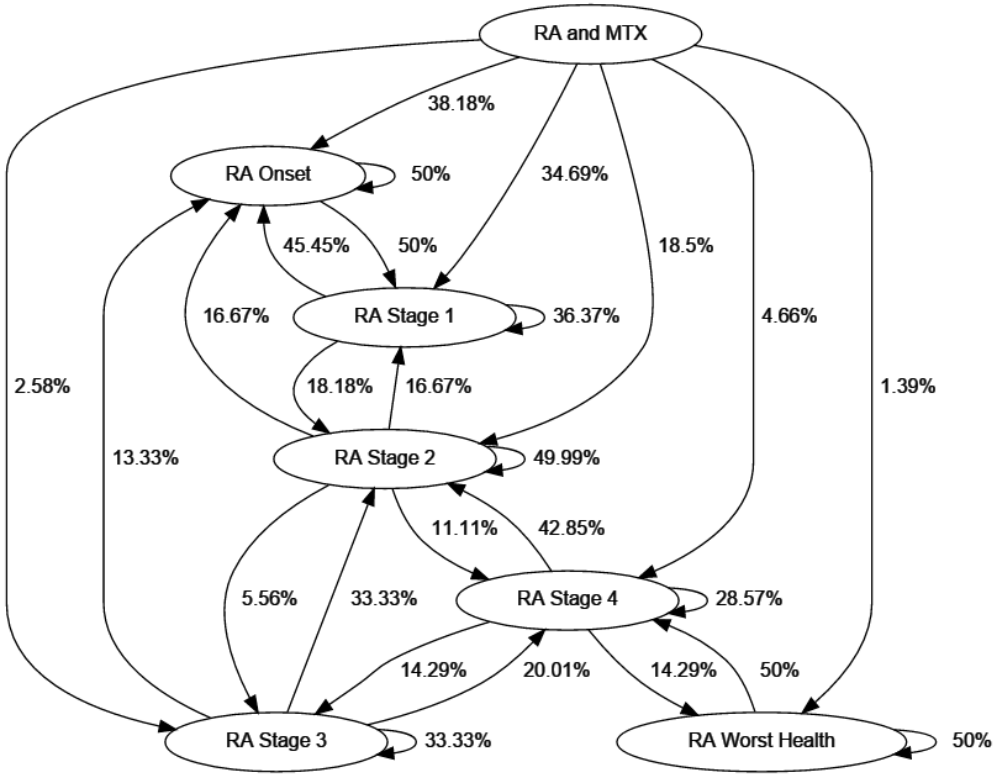
Markov Modelling

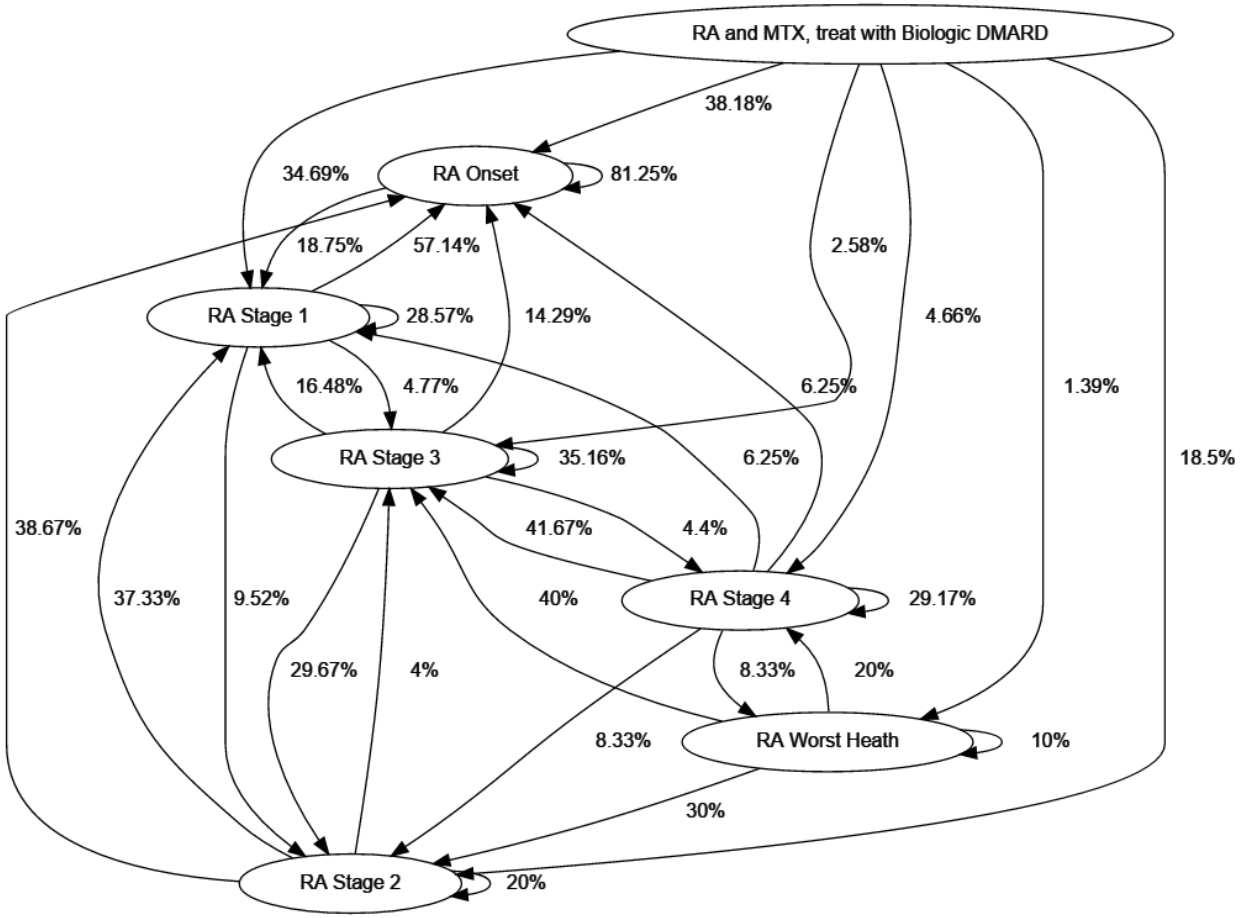


Opportunity Cost:

- "An option that becomes no longer available when another option is chosen…"
- The patients who lose out when healthcare resources are used for something other than treating their particular problems.

Our results!


RA and MTX
38.18%
RA Onset
50%
34.69%
45.45%
50%
18.5%
16.67%
RA Stage 1
36.37%
4.66%
2.58%
18.18%
16.67%
1.39%
13.33%
RA Stage 2
49.99%
11.11%
42.85%
5.56%
33.33%
RA Stage 4
28.57%
14.29%
20.01%
14.29%
50%
RA Stage 3
33.33%
RA Worst Health
50%


RA and MTX, treat with Biologic DMARD
38.18%
34.69%
RA Onset
81.25%
18.75%
57.14%
2.58%
RA Stage 1
28.57%
14.29%
4.66%
16.48%
4.77%
6.25%
1.39%
RA Stage 3
35.16%
6.25%
18.5%
38.67%
41.67%
4.4%
37.33%
9.52%
40%
RA Stage 4
29.17%
29.67%
4%
8.33%
20%
8.33%
RA Worst Heath
10%
30%
RA Stage 2
20%

Cost Effectiveness, and Cost Effectiveness based purchasing.

- Achieving “efficiency” in healthcare is not about, and will not be achieved by getting drugs cheaply, or getting bigger budgets to purchase services.

- Healthcare budgets are a scare resource. Efficient Healthcare is achieved when the most health gains possible are achieved with the budget available.

- Cost effectiveness analysis quantifies how much benefit is derived for an expenditure.

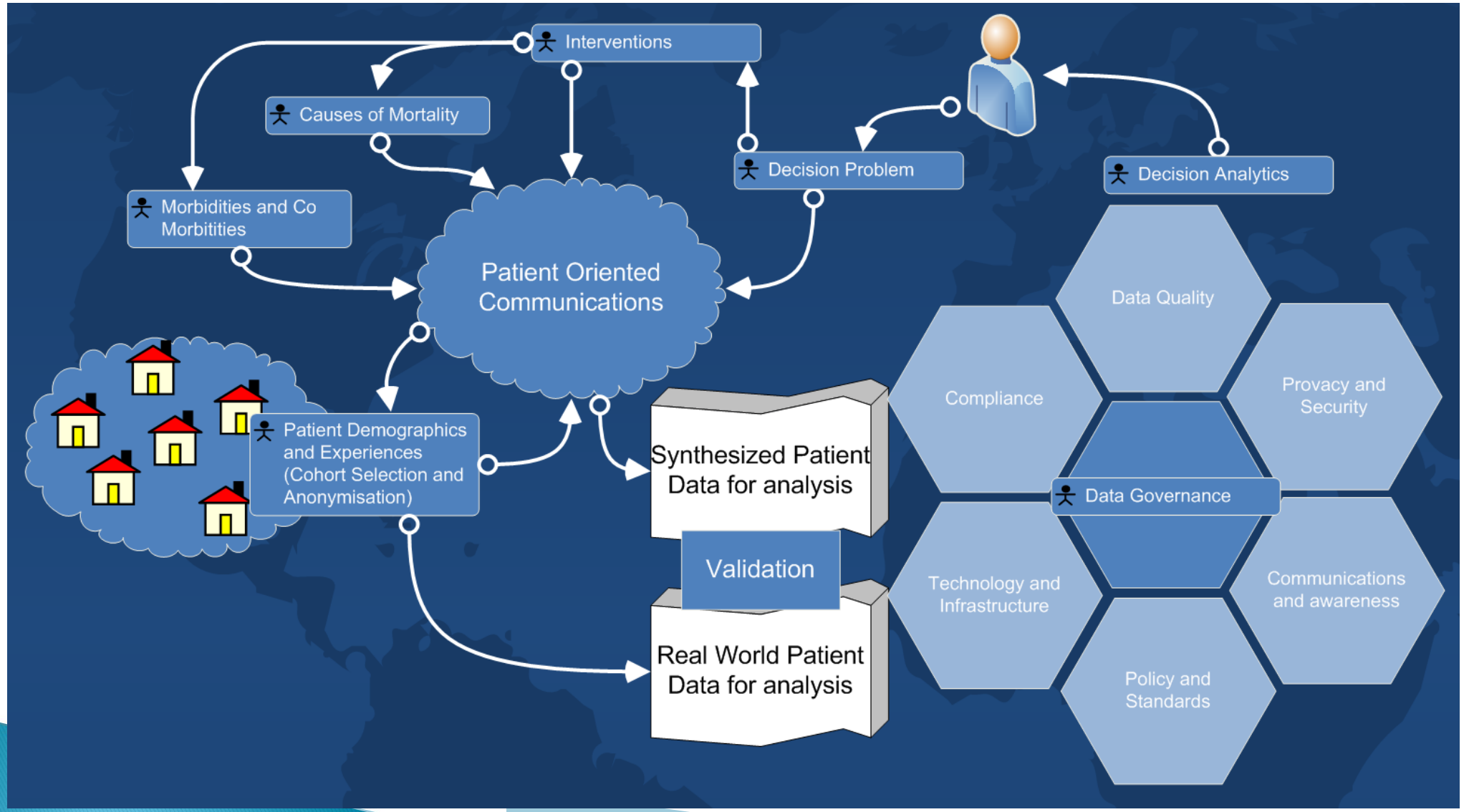
Threshold vs Value Based Pricing

- A Threshold gives a “go/no go” decision when considering technologies in isolation.
  - Assumes “either”
    - Additional money will be found to fund the technology.
    - Or, Less cost effective technologies will be displaced
- Current research doesn’t “really” support these assumptions, hence the desire for Value Based Pricing.
  - Missing quantification of important factors in the decision making process.
    - Most HTA bodies use a more hybrid approach, akin to MCDA, for example nice, where certainty around estimates play an important part in the recommendation.
- A “true” Value Based Pricing approach has not yet been implemented anywhere in the world.
  - The value of “all” technologies change when a new technology enters the system.
  - The relative value of “all” technologies change when the price of one technology changes and value is a function of price.

With the right technology, Value Based Pricing is “easy”

- Use the cost effectiveness estimate at the current the price to decide what is the “cheapest bid” when technologies have different efficacy, and/or utility.
- Use budget pools to control spending.
- Example we will use next, is of the Hepatitis C Virus

Agent Oriented (Health) Economics



Hepatitis C Virus and Treatments

- Chronic Hepatitis C is a virus which causes liver damage, increases the likelihood of liver cancer, and eventually ends in Decompensated Cirrhosis and either transplant or death. As a virus, it is difficult to treat effectively, and many current treatments have severe side effects which often result in discontinuation of treatment.

- Between 2014 and 2016 there will be, potentially, 19 treatment regimens ranging from Single Pill to Quad therapy options, each with varying SVR, treating 6/7 Genotypes, Treatment naïve and relapsers, Null and partial responders and special populations: HIV co-infection, hemophiliacs, IFN intolerant or ineligible - creating 1000's of treatment pathways.

- The complexity of the HCV market makes targeting information to specific stakeholders a challenge.

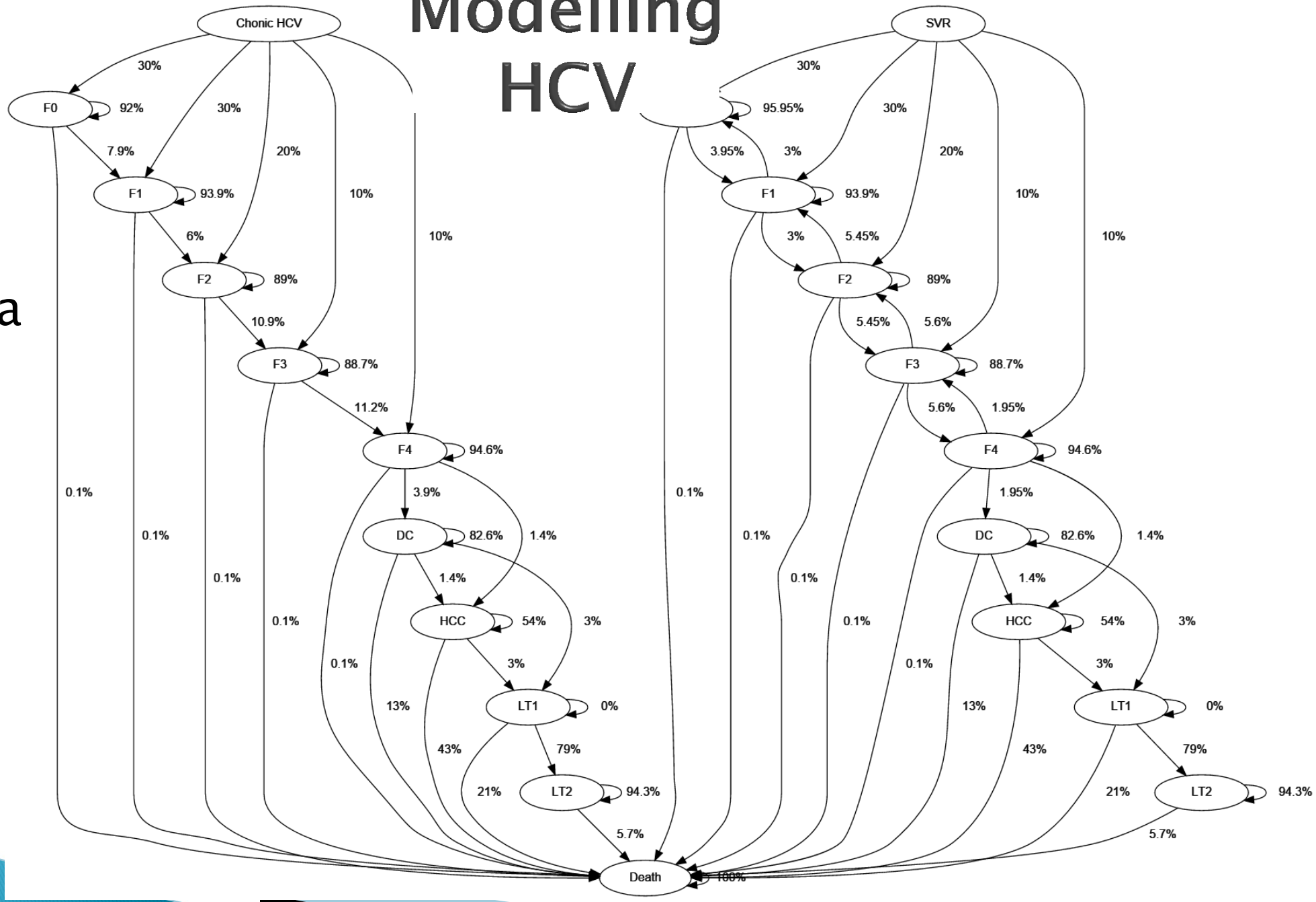
- HCV is an international Market, but with the advent of increasingly successful cures, rapidly shrinking. With the rapid introduction of increasingly potent direct-acting antivirals (DAA) for hepatitis C virus, the global public health community faces the possibility of eradicating a virus without a vaccine for the first time.

Let's Practice

- Game Two
  - Chronic Hepititis C.
    - Similar to Rheumatoid Arthritis around 26,000 People suffering from the disease in Serbia
    - This time however, the population is limited. With only a small number of new infections (most patients contracted the disease from contaminated blood), once an SVR is achieved, patients no longer need therapy.
  - Some simplifications
    - For simplicities sake, we are ignoring important factors such as comorbidities, HCV genotypes and treatment history.
  - Central Tendering Proposition
    - In the simplified version of VBP, Value is defined as a function of both price and efficacy.
      - A treatment with 50% efficacy @ €1000 has the same value as a treatment with 100% efficacy @ €2000
        - A realistic version of this game would use CUA and MCDA. (discussed next, and by Neven earlier)
    - Set a budget for this class of drugs and buy "best value bid first"
      - This Game uses a budget of €500,000 per month.
  - You are about to be given control of a company, that is manufacturing and selling a HCV treatment.
    - Your product will be "used" on an estimation of the Serbian population. The results of which will be both shown during and presented at the end of the game.

Modelling HCV

- First lets adapt the model to a Serbian context.



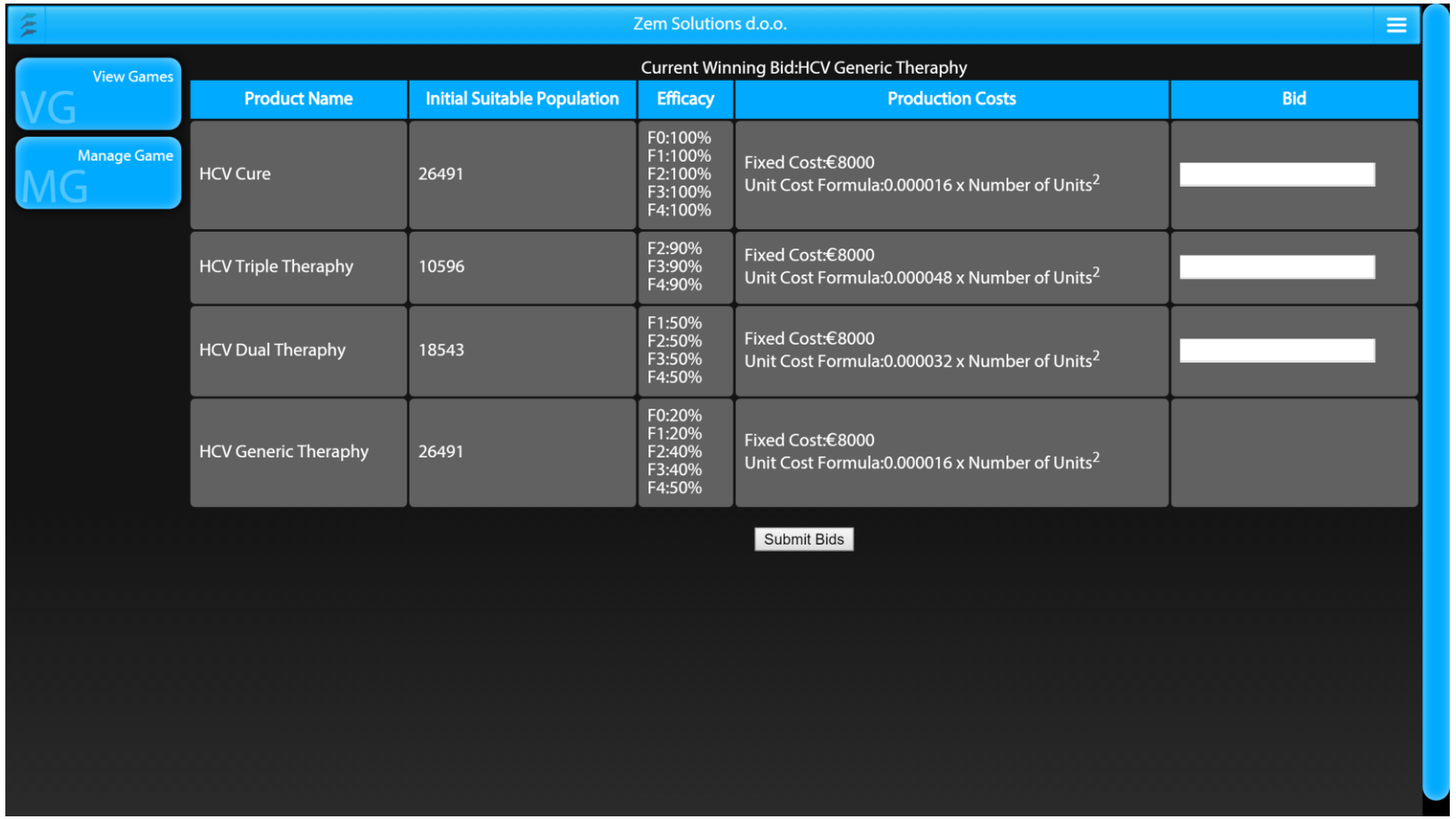
Choose your product

- To produce your product, you must buy a licence from the patent holder, otherwise you will be stuck producing a low efficacy aging product.

- To do this, you must bid against the other players for it. You can bid as much as you want, but the money will come in the form of a loan, which must be repaid, plus interest (at a rate of 15% per annum)

Join the game

- Pricing you must choose for yourself after the game starts.
- New technologies have a distinct advantage, but if you bid too much, you will loose your income in loan repayments – remember, highest bank balance wins!
- Think Strategically.



- Good Luck!

Conclusion and Open Discussion

- The results of these games represent “new” knowledge.
  - This is the first time they have been played in this context. Previously used only in a “pure research” context by a small group of core researchers investigating “whole system design”.

- There is a long and difficult road ahead, before all the issues presented in this workshop are properly addressed.
  - BUT WE CAN GET THERE!