

ECON306: The Economics of Health + Education

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www.otago.ac.nz/economics/staff/otago077900.html
- Office hours:** Whenever I'm around, **especially immediately after class**, or email or Zoom/Teams me ...
- Lectures:** **11 - 11.50 am, Monday, Tuesday and Wednesday** – rooms to be advised.
- Tutorials:** **One each fortnight** (i.e. 6 tutorials) – groups and rooms to be advised in the first week of lectures. The two times are: **9 - 9.50 am or 12 - 12.50 am, every second Friday, beginning in the second week.**

Welcome to ECON306!

After social welfare, health and education are the largest areas of government spending in most modern economies, including NZ. Together, health and education account for about 13% of NZ's GDP. (Obviously too, the Covid-19 pandemic focussed attention on the importance of the health sector.)

This paper is about the *economic* analysis of the health and education sectors, including government policy. Theoretical foundations and techniques of economic evaluation and decision-making are also covered. (*These things are very useful in a wide variety of jobs – inside and outside the health sector – when you graduate!*) See the course overview for topics covered on pages 6-12 below.

ECON306 is a great opportunity to apply a wide range of microeconomic concepts and techniques (e.g. some covered in ECON201) to important real-world issues, such as health care rationing, priority-setting, the 'value of life' and 'user-pays' (i.e. student fees and loans) in education.

Pre-requisite: ECON201 or ECON271 (or equivalent from another university).

Inside this handout

- Course objectives
- Course learning resources
- Workload (yours!) expectations
- Assessment
- Student feedback
- Required reading and further reading
- Course overview and weekly readings
- A couple of the required readings ...

Course objectives

1. To apply the microeconomic tools and concepts introduced in first- and second-year Economics courses to the topics of health and education, including contemporary policy issues.
2. To introduce you to *new* microeconomics tools and concepts, as required.
3. To equip you with the skills to be able to understand and critique economic evaluations of health care interventions, and to be able to apply these evaluation skills more generally (i.e. to *any* economic project appraisal).
4. In general, to encourage you to develop analytical and decision-making skills, including modest technical and quantitative proficiencies.

Learning resources

Lecture slides will be posted on BlackBoard prior to lectures. Naturally, if you are unable to attend a lecture, you're expected to catch-up yourself.

A Reading Guide and Tutorials hand-out will be distributed in the first few lectures and on BlackBoard.

Tutorials begin in the **second** week of the semester. You will be allocated to a tutorial and this will be available in eVision. Tutorial times and locations will be notified during the first week of lectures.

As the key feature of tutorials is student participation, **please prepare for tutorials by working on the tutorial questions before going along. And please read the associated readings...**

Readings

Each week you will be assigned '*Required Reading*' (that you **must** do) – available in eReserve (via BlackBoard) – and suggestions for possible '*Further Reading*' (that you **may** do – i.e. it's up to you!).

The *Required Reading* is a specially-selected collection of photocopied readings from textbooks, *The Economist* magazine and other sources. Additional readings and sources may be posted on BlackBoard during the course.

This approach allows me to tailor the readings to what I intend covering in the course (rather than the other way round), and via *The Economist* articles, to provide up-to-date examples of real-world applications.

Student webmail

Blackboard is used to email the whole class so it is important that you check your student email and Blackboard regularly, or use eVision to redirect your emails to your personal account. **Please forward your University email address to an email address that you use regularly.**

Workload (*yours!*) expectations (*mine!*)

As this is an 18 point course, using the University's 'rule of thumb' you should devote about 12 hours per week to this course during the semester. Obviously, three of these hours are spent in lectures and one every other week in tutorials – leaving 8-9 hours (each week!) for your own reading and study, internal assessment work and revision! *Yep!!!*

Assessment

Unless stated otherwise, all aspects of the course are examinable. All-important assessment information such as due dates and times, content, guidelines and so on will be discussed in lectures and, where appropriate, detailed on Blackboard.

Assessment	% of final grade	
Test	15%	The test covers Part I of the course (lectures, tutorials and 'required reading') and is scheduled for Wednesday 28 August (in class).
Assignment	15%	The assignment covers Part II of the course and will be distributed in Week 8 (due date, Week 11: 2 October).
Final exam	70%	The two hour exam will, potentially, cover all material included in lectures, tutorials and the 'required reading'.
PLUSSAGE APPLIES (<i>talk to me if you don't understand what this means</i>)		

Written answers to previous exams/tests will not be provided. Assignments and tests will be returned in class, or can be picked up from the Economics reception (5th floor, Commerce), **9 am - 5 pm**.

Grading

The grading scheme used at Otago is:

A+	90-100%	B+	75-79	C+	60-64	D	40-49
A	85-89	B	70-74	C	55-59	E	<40
A-	80-84	B-	65-69	C-	50-54		

Academic integrity

Academic integrity means being honest in your studying and assessments. It is the basis for ethical behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A

more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website at www.otago.ac.nz/study/academicintegrity/index.html or ask at the Student Learning Centre or Library. If you have any questions, ask your lecturer. Further information can be found via the links available from the link above.

Student feedback

Class representatives

The class rep system is an avenue for encouraging communication and consultation between staff and students. It provides you with a vehicle for communicating your views on the teaching and delivery of the paper and provides staff with an opportunity to communicate information and gain constructive feedback from students.

Volunteers for the role of class reps will be called for early in the semester. OUSA invites all class reps to a training session, conducted by OUSA, about what it means to be a class rep and some of the possible procedures for dealing with issues that arise.

Departmental staff will also meet with class reps during the semester to discuss general issues or matters they wish to have considered. Your class rep's name and contact details will be posted on Blackboard.

Concerns about the course

I hope you will feel comfortable talking to me if you have any concerns about the course.

Alternatively, you can report your concerns to the class representative who will follow up with departmental staff. If, after making approaches via these channels, you do not feel that your concerns have been addressed, there are University channels that may aid resolution. For further advice or more information on these, contact the departmental administrator or head of department.

I hope you'll enjoy ECON306!

I do!

Paul 😊

Required reading and *further* reading

As always, please read the Required Reading (in eReserve on BlackBoard) before lectures.

In addition, though you are not required to read them, Further Reading is available if **you** want to extend your knowledge (i.e. it's up to you!).

There are two types of Further Reading:

1. Specific articles, chapters or reports that will be noted each week and are mostly available online via the Library's website: www.otago.ac.nz/library
2. Health Economics textbooks that are mostly available from the University's *Medical Library*.¹

With respect to this second category, some books are on Reserve at the Medical Library and others are on the main shelves. It's up to you to look in the Contents or Index of these books to find material appropriate to what you want to read.

Below are examples of popular Health Economics textbooks (note, there are many others too). Some of the Required Readings are from them.

- C. Donaldson & K. Gerard, *Economics of Health Care Financing: The Visible Hand*.
- R.E. Santerre & S.P. Neun, *Health Economics: Theories, Insights and Industry Studies*.
- P. Feldstein, *Health Care Economics*.
- S. Folland, A. Goodman & M. Stano, *The Economics of Health and Health Care*.
- T.E. Getzen, *Health Economics and Financing*.
- B. McPake, C. Normand & S. Smith, *Health Economics: An International Perspective*.
- T. Rice & L. Unruh, *The Economics of Health Reconsidered*.
- M. Drummond, M. Sculpher, K. Claxton, G. Stoddart & G. Torrance, *Methods for the Economic Evaluation of Health Care Programmes*.
- M. Gold, J. Siegel, L. Russell & M. Weinstein (editors), *Cost-effectiveness in Health and Medicine*.
- G. Kobelt, *Health Economics. An Introduction to Economic Evaluation*.

¹ The Medical Library is in the Sayers Building, 290 Great King Street. Enter through the south entrance on Great King Street, or through the Lindo Ferguson Building at 1st floor level.

Course overview and weekly readings

There are three parts to ECON306, covering 12 main topics, as outlined below, with the reading (relax! Most of the items are short).

The six tutorials are in the accompanying **Tutorials handout**. Two of the readings mentioned below appear at the end of the current handout.

As always, please prepare for and attend all classes to gain full benefit from the course. And please do the reading!!!

Week	Topic	Tutorial
Part I: The Economics of Health and Health Care		
Week 1 15, 16, 17 Jul	<p style="text-align: center;">1. Introduction</p> <ul style="list-style-type: none"> • Introduction to ECON306 and Part I of the course. • Health care as an <i>economic good</i> (what's an <i>economic good</i>?) • Determinants of health, including the effects of health care. (<i>The health production function</i>.) <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * R.E. Santerre & S.P. Neun, "The theories X and Y of health economics", pp. 18-21 in <i>Health Economics: Theories, Insights and Industry Studies</i>, Dryden Press, 2000. * A. Alchian & W. Allen, "Need versus demand" and "Alleged exceptions to the law of demand", pp. 75-6 in <i>Exchange and Production: Theory in Use</i>, Wadsworth Publishing Company, 1964. * "Catching Up", <i>The Economist</i>, Jan 12th 2013. * S. Folland, A. Goodman & M. Stano, "The production of health", Ch. 5 in <i>The Economics of Health and Health Care</i>, Pearson, 2013. * "Lifting the burden?", <i>The Economist</i>, Dec 15th 2012. * P. Hansen & A. Graham, "Human organ transplants, for love or money?", Ch. 4 in P. Hansen & A. King (editors), <i>Keeping Economics Real: New Zealand Economic Issues</i>, Pearson Education New Zealand, 2004. [see the copy at the end of this handout] <p>Further Reading (optional)[#]</p> <ul style="list-style-type: none"> ○ K. Arrow (1963), "Uncertainty and the welfare economics of medical care", <i>American Economic Review</i>, 53, 941-73. (This seminal article is also referred to in Week 3.) 	next week
Week 2 22, 23, 24 Jul	<p style="text-align: center;">2. The demand for health and health care</p> <ul style="list-style-type: none"> • Health capital and the Grossman and Wagstaff models. • Plus other things missing from the demand models: health care 'quality', the effects of health insurance and subsidies, etc. 	Tutorial 1 26 Jul

[#] Each week you are welcome also to 'dip into' the Health Economics textbooks mentioned earlier.

	<p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * A. Wagstaff (1986), "The demand for health: theory and applications", <i>Journal of Epidemiology and Community Health</i>, 40, 1-11. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> o M. Grossman (1972), "On the concept of health capital and the demand for health", <i>Journal of Political Economy</i>, 80, 223-55. 	
<p>Week 3 29, 30, 31 Jul</p>	<p style="text-align: center;">3. The role of government, and supplier-induced demand</p> <ul style="list-style-type: none"> • Why do most governments, to some extent, fund and regulate health care? (<i>Normative and positive theories of government intervention.</i>) • What influence do doctors have on the demand for their services? (<i>The supplier-induced demand hypothesis and alternative theories.</i>) <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * C. Donaldson & K. Gerard, "Market failure in health care: justifying the visible hand", Ch. 3 in <i>Economics of Health Care Financing: The Visible Hand</i>, Palgrave Macmillan, 2005. * P. Feldstein, "The legislative workplace", pp. 437-42 in <i>Health Care Economics</i>, Thomson Delmar Learning, 2005. * T. Rice & I. Unruh, "Are supply and demand independently determined?", pp. 161-9 in <i>The Economics of Health Reconsidered</i>, Health Administration Press, 2009. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> o K. Arrow (1963), "Uncertainty and the welfare economics of medical care", <i>American Economic Review</i>, 53, 941-73. o A. Culyer (1971), "The nature of the commodity 'health care' and its efficient allocation", <i>Oxford Economic Papers</i>, 23, 189-211. 	<p>next week</p>
<p>Week 4 5, 6, 7 Aug</p>	<p style="text-align: center;">4. Microeconomics of health insurance</p> <ul style="list-style-type: none"> • Why do people buy health insurance? (<i>Attitudes to risk and the demand for health insurance.</i>) • Things that go wrong in insurance (free) markets. (<i>Asymmetric information, moral hazard and adverse selection.</i>) <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * P. Feldstein, "The demand for health insurance", Ch. 6 in <i>Health Care Economics</i>, Thomson Delmar Learning, 2005. * "India's government launches a vast health-insurance scheme, <i>The Economist</i>, Sep 27th 2018. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> o M. Pauly (1968), "The economics of moral hazard: comment" and K. Arrow (1968), "The economics of moral hazard: further comment", <i>American Economic Review</i>, 58, 531-9. o M.S. Feldstein (1973), "The welfare loss of excess health insurance", <i>Journal of Political Economy</i>, 81, 251-80. 	<p>Tutorial 2 9 Aug</p>

Week 5 12, 13, 14 Aug	<p style="text-align: center;">5. Hospital behaviour, and health systems</p> <ul style="list-style-type: none"> • What do hospitals seek to maximise? Profits? Patients treated? Quality? All of the above? (<i>Economics models of hospitals.</i>) • A quick review of health systems internationally, including the New Zealand health system and reforms in the last 30 years. <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * R.E. Santerre & S.P. Neun, "The conduct of the hospital services industry", pp. 406-12 in <i>Health Economics: Theories, Insights and Industry Studies</i>, South-Western Cengage Learning, 2013. * B. McPake & C. Normand, "Health systems around the world: An introduction to variation and performance", Ch. 21 in <i>Health Economics: An International Perspective</i>, Routledge, 2013. * T. Ashton, N. Mays & N. Devlin (2005), "Continuity through change: The rhetoric and reality of health reform in New Zealand", <i>Social Science & Medicine</i> 61, 253-62. * R. Gauld (2012), "New Zealand's post-2008 health system reforms: Toward re-centralization of organizational arrangements", <i>Health Policy</i> 106, 110-13. * J. Logan (1986), "Bob's Party (A Cautionary Tale)". (This article is a satire of the reforms to the Australian health care system in the late 1980s. Please read as preparation for Tutorial 3, before the 15% test.) <p>Further Reading (optional)</p> <ul style="list-style-type: none"> ○ J. Newhouse (1970), "Towards a theory of nonprofit institutions: an economic model of a hospital", <i>American Economic Review</i>, 8, 467-82. ○ P. Jacobs (1974), "A survey of economic models of hospitals", <i>Inquiry</i>, 11, 83-97. ○ M. Gaynor (1994), "Issues in the industrial organisation of the market for physician services", <i>Journal of Economics and Management Strategy</i>, 3, 211-55. ○ R. Vaithianathan (1999), "The failure of corporatisation: public hospitals in New Zealand", <i>Agenda</i> 6, 325-38. ○ P. Smith & I. Papanicolas (editors), "Health system performance comparison: an agenda for policy information and research", World Health Organization, 2013. Available from www.euro.who.int/ data/assets/pdf file/0009/244836/Health-System-Performance-Comparison.pdf. ○ M.J. Laugesen & R. Gauld, <i>Demographic Governance and Health: Hospitals, Politics and Health Policy in New Zealand</i>, Otago University Press, 2012. 	next week
<h2>Part II: Health Economic Evaluation and Decision-making</h2>		
Week 6 19, 20, 21 Aug	<p style="text-align: center;">6. Introduction to Part II, and main types of economic evaluation</p> <ul style="list-style-type: none"> • Introduction to Part II of the course. • Economics-based approaches to allocating health care spending. • Overview of <i>Cost-Minimisation Analysis</i>, <i>Cost-Benefit Analysis</i>, <i>Cost-Effectiveness Analysis</i> and <i>Cost-Utility Analysis</i>. 	Tutorial 3 23 Aug

	<p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * N. Devlin & P. Hansen (2000), "Allocating Vote: Health — 'needs assessment' and an economics-based approach", <i>Treasury Working Paper 00/4</i>, New Zealand Treasury. * D. Kernick (1998), "Economic evaluation in health: a thumb nail sketch", <i>British Medical Journal</i> 316, 1663-5. * M. Drummond, B. O'Brien, G. Stoddart & G. Torrance, "Basic types of economic evaluation", Ch. 2 in <i>Methods for the Economic Evaluation of Health Care Programmes</i>, Oxford University Press, 2005. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> o M. Drummond, M. Sculpher, K. Claxton, G. Stoddart & G. Torrance, <i>Methods for the Economic Evaluation of Health Care Programmes</i>, Oxford University Press, 2015. o P. Neumann, G Sanders, L Russell, J Siegel & T Ganiats (editors), <i>Cost-effectiveness in Health and Medicine</i>, Oxford University Press, 2016. o G. Kobelt, <i>Health Economics. An Introduction to Economic Evaluation</i>, Office of Health Economics, 2013, www.ohe.org/publications/health-economics-introduction-economic-evaluation. 	
<p>Week 7 26, 27, 28* Aug</p>	<p style="text-align: center;">7. Valuing human life (26, 27 Aug), and 15% test covering Part I (28 Aug)</p> <ul style="list-style-type: none"> • What is the value of a human life? (<i>Techniques for valuing 'statistical' lives.</i>) <p>☞ *15% test in Wed's class (28 Aug), covering Part I of the course.</p> <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * "The price of a life, <i>The Economist</i>, Dec 4th 1993. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> o M. Drummond, M. Sculpher, K. Claxton, G. Stoddart & G. Torrance, <i>Methods for the Economic Evaluation of Health Care Programmes</i>, Oxford University Press, 2015. o P. Neumann, G Sanders, L Russell, J Siegel & T Ganiats (editors), <i>Cost-effectiveness in Health and Medicine</i>, Oxford University Press, 2016. o G. Kobelt, <i>Health Economics. An Introduction to Economic Evaluation</i>, Office of Health Economics, 2013. www.ohe.org/publications/health-economics-introduction-economic-evaluation. 	<p>next week (after Mid-Sem Break)</p>
<p>Mid-Semester Break, 2 Sep - 6 Sep</p>		
<p>Week 8 9, 10, 11 Sep</p>	<p style="text-align: center;">8. Basic techniques of project appraisal / economic evaluation</p> <ul style="list-style-type: none"> • Discounting, including discounting years of life. (<i>Time value of money.</i>) • Dealing with risk and uncertainty when making decisions. (<i>Decision-making under conditions of risk and uncertainty.</i>) <p>☞ 15% Assignment covering Part II distributed.</p> <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * D Salvatore, excerpts from Ch. 14 ("Long-run investment decisions: capital budgeting"), <i>Managerial Economics in a Global Economy</i>, Thomson Learning, 2004. 	<p>Tutorial 4 13 Sep</p>

	<p>* "Apocalypse maybe", <i>The Economist</i>, Mar 30th 1996</p> <p>* J. Diamond, "That daily shower can be a killer", <i>The New York Times</i>, Jan 28th 2013</p> <p>Further Reading (optional)</p> <ul style="list-style-type: none"> ○ M. Drummond, M. Sculpher, K. Claxton, G. Stoddart & G. Torrance, <i>Methods for the Economic Evaluation of Health Care Programmes</i>, Oxford University Press, 2015. ○ P. Neumann, G Sanders, L Russell, J Siegel & T Ganiats (editors), <i>Cost-effectiveness in Health and Medicine</i>, Oxford University Press, 2016. ○ G. Kobelt, <i>Health Economics. An Introduction to Economic Evaluation</i>, Office of Health Economics, 2013. www.ohe.org/publications/health-economics-introduction-economic-evaluation. 	
<p>Week 9 16, 17, 18 Sep</p>	<p style="text-align: center;">9. Health-related quality of life (HRQoL), and fairness / equity / justice</p> <ul style="list-style-type: none"> ● <i>Cost-Utility Analysis (CUA) and Quality-Adjusted Life Years (QALYs)</i> ● What are 'fair'/'equitable'/'just' allocations of health/health care? (<i>Common distributional value judgements.</i>) ● Methods for measuring and valuing HRQoL <p>Required Reading (eReserve on BlackBoard)</p> <p>* G. Kobelt, "Cost-utility analysis" (pp. 75-89) and "Cost-benefit analysis" (pp. 94-99), in <i>Health Economics: An Introduction to Economic Evaluation</i>, Office of Health Economics, 2002.</p> <p>* "Outgoing drug boss says 'it's not easy to play God'", <i>Fairfax NZ News</i>, Sep 15th 2013.</p> <p>* R. Gillon (1985), "Justice and allocation of medical resources", <i>British Medical Journal</i>, 291, 266-8.</p> <p>Further Reading (optional)</p> <ul style="list-style-type: none"> ○ N. Devlin & P. Hansen (1999), "Ethical precepts of cost-utility analysis", <i>Otago Bioethics Report</i>, 8, 2, 16-20. ○ G. Mooney, "Equity", Ch. 5 in <i>Key Issues in Health Economics</i>, Harvester Wheatsheaf, 1994. ○ M. Drummond, M. Sculpher, K. Claxton, G. Stoddart & G. Torrance, <i>Methods for the Economic Evaluation of Health Care Programmes</i>, Oxford University Press, 2015. ○ P. Neumann, G Sanders, L Russell, J Siegel & T Ganiats (editors), <i>Cost-effectiveness in Health and Medicine</i>, Oxford University Press, 2016. ○ G. Kobelt, <i>Health Economics. An Introduction to Economic Evaluation</i>, Office of Health Economics, 2013. www.ohe.org/publications/health-economics-introduction-economic-evaluation. 	<p>next week</p>
<p>Week 10 23, 24, 25 Sep</p>	<p style="text-align: center;">10. Multi-Criteria Decision-Making (MCDM) and Choice Modelling in the health sector</p> <ul style="list-style-type: none"> ● (Hopefully 😊) Visit from PHARMAC to talk about their work and careers there. ● Introduction to MCDM and Choice Modelling tools and techniques. (<i>MCDM and Choice Modelling.</i>) 	<p>Tutorial 5 27 Sep</p>

	<ul style="list-style-type: none"> Health applications: prioritising pharmaceuticals and patients, disease classification, valuing Health-Related Quality of Life (HRQoL), etc. (<i>Health Technology Prioritisation, HRQoL, etc.</i>) <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * L. Buchanan & A. O’Connell (2006), “A brief history of decision making”, <i>Harvard Business Review</i> 84, 32-41. * P. Hansen & N. Devlin (2019), “Multi-Criteria Decision Analysis (MCDA) in health care decision making”, In: <i>Oxford Research Encyclopedia of Economics and Finance</i>, Oxford University Press. https://oxfordre.com/economics/view/10.1093/acrefore/9780190625979.001.0001/acrefore-9780190625979-e-98 * O. Golan & P. Hansen (2012), “Which health technologies should be funded? A prioritization framework based explicitly on value for money”, <i>Israel Journal of Health Policy Research</i>, 1, 44. https://ijhpr.biomedcentral.com/articles/10.1186/2045-4015-1-44 <p>Further Reading (optional)</p> <ul style="list-style-type: none"> o P. Thokala, N. Devlin, K. Marsh et al (2016), “Multiple Criteria Decision Analysis for Health Care Decision Making – An Introduction: Report 1 of the ISPOR MCDA Emerging Good Practices Task Force”, <i>Value in Health</i>, 19, 1-13. o K. Marsh, M. IJzerman, P. Thokala et al (2016), “Multiple Criteria Decision Analysis for Health Care Decision Making – Emerging Good Practices: Report 2 of the ISPOR MCDA Emerging Good Practices Task Force”, <i>Value in Health</i>, 19, 125-37. o T. Sullivan & P. Hansen (2017), “Determining criteria and weights for prioritizing health technologies based on the preferences of the general population: A New Zealand pilot study”, <i>Value in Health</i>, 20, 679-86. o D. Kahneman (2011), Chs 20-22 (“The illusion of validity”, “Intuitions vs. formulas”, “Expert intuition: When can we trust it?”), <i>Thinking, Fast and Slow</i>, Farrar, Straus and Giroux. o E. Forman & M. Selly (2001), Chs 1-3 (“Introduction”, “Problem solving & decision-making”, “Decision-making concepts & methodologies”), <i>Decision by Objectives</i>, https://professorforman.com/wp-content/uploads/2019/06/dbo.pdf. o Department for Communities and Local Government (2009), <i>Multi-Criteria Analysis: A Manual</i>, http://eprints.lse.ac.uk/12761/1/Multi-criteria_Analysis.pdf. o V. Belton & T. Stewart (2002), <i>Multiple Criteria Decision Analysis: An Integrated Approach</i>, Kluwer Academic Publisher (e.g. the first few chapters). o P. Hansen & F. Ombler (2008), “A new method for scoring multi-attribute value models using pairwise rankings of alternatives”, <i>Journal of Multi-Criteria Decision Analysis</i> 15, 87-107. o R. Haas & O. Meixner, <i>An Illustrated Guide to the Analytic Hierarchy Process</i>, https://docplayer.net/14799088-An-illustrated-guide-to-the-analytic-hierarchy-process.html. 	
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Part III: The Economics of Education

<p>Week 11 30 Sep, 1, 2 Oct</p>	<p>11. Introduction to Part III, government involvement, and topical issues</p> <ul style="list-style-type: none"> Introduction to Part III of the course. Education as an <i>economic</i> good. 	<p>next week</p>
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	<ul style="list-style-type: none"> • Why do most governments fund and regulate education? • User-pays (student fees and student loans) and other topical NZ issues (e.g. MOOCs, research funding). <p>☞ Assignment due in Wednesday's class (2 Oct).</p> <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * P. Hansen, "Borrowing to learn, or learning to borrow? Student fees and the Student Loans Scheme", Ch. 2 in P. Hansen & A. King (editors), <i>Keeping Economics Real: New Zealand Economic Issues</i>, Pearson Education New Zealand, 2004. * "Creative destruction", <i>The Economist</i>, Jun 28th 2014. * "The digital degree", <i>The Economist</i>, Jun 28th 2014. * "Established education providers v new contenders", <i>The Economist</i>, Jan 12th 2017. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> ○ M. Peters & M. Olssen, "Compulsory education in a competition state", Ch. 10 in J. Boston, P. Dalziel & S. St John (editors), <i>Redesigning the Welfare State in New Zealand: Problems, Policies and Prospects</i>, Oxford University Press, 1999. ○ J. Boston, "The funding of tertiary education: enduring issues and dilemmas", Ch. 11 in J. Boston, P. Dalziel & S. St John (editors), <i>Redesigning the Welfare State in New Zealand: Problems, Policies and Prospects</i>, Oxford University Press, 1999. ○ Education and Sciences Committee, <i>Inquiry into Student Fees, Loans, Allowances and the Overall Resourcing of Tertiary Education</i>, 2001. Available from: www.clerk.parliament.govt.nz/content/28/i2c.pdf. ○ Ministry of Education, <i>Student Loan Scheme Annual Report 2018</i>. Available from: www.educationcounts.govt.nz/publications/80898/student-loan-scheme-annual-report-2018. 	
Week 12 7, 8, 9 Oct	<p style="text-align: center;">12. Human capital and signalling</p> <ul style="list-style-type: none"> • Private and social rates of return to education. (<i>Human capital theory of education.</i>) • Educational achievement as a screening device for ability used by employers. (<i>Signalling theory of education.</i>) <p>Required Reading (eReserve on BlackBoard)</p> <ul style="list-style-type: none"> * R. Ehrenberg & R. Smith, "Investments in human capital: education and training", Ch. 9 in <i>Modern Labour Economics: Theory and Public Policy</i>, Pearson Education, 2006. * "Secrets and agents", <i>The Economist</i>, Jul 23rd 2016. <p>Further Reading (optional)</p> <ul style="list-style-type: none"> ○ P. Mahoney, Z. Park & R. Smyth, "Moving on up – What young people earn after their tertiary education", Ministry of Education, 2013. Available from: www.educationcounts.govt.nz/publications/tertiary_education/education-outcomes/115410. 	Tutorial 6 11 Oct
Week 13 14, 15 Oct	<p style="text-align: center;">13. Catch-up / revision / exam prep</p> <ul style="list-style-type: none"> • May need a class this week because of the PHARMAC visit in Week 10. • Revision / exam preparation session – but only if you want to. • No classes planned for 16 Oct ... 	

A couple of the required readings here ...

1. P. Hansen & A. Graham, "Human organ transplants, for love or money?", Ch. 4 in P. Hansen & A. King (editors), *Keeping Economics Real: New Zealand Economic Issues*, Pearson Education New Zealand, 2004.
2. "Apocalypse maybe", *The Economist*, Mar 30th 1996



Human organ transplants, for love or money?

Paul Hansen and Andrew Graham

KEY CONCEPTS: consumers' surplus, forward contract, 'invisible hand' theorem, producers' surplus, rationality

FOR SALE: 1 kidney, 35 years old but in good condition. One careful lady owner — \$100 000 o.n.o. To many people, such an advertisement in the 'For Sale' section of the newspaper would seem macabre, perhaps even obscene. But there have been ads just like it on the internet offering all sorts of body parts for sale. A few years ago in New Zealand, a woman advertised that she was willing to give one of her kidneys in exchange for her credit card bill being paid. The transaction never took place (although apparently her bill was covered by donations).

Buying or selling human organs is illegal in New Zealand, as it is in most countries. Live organ donors are not even compensated for their travel expenses or time spent recovering after their operations (Fleming, 2003). And yet there are not enough donated organs to meet demand. (This matches the definition of an economic good: one for which, at a zero price, there is excess demand.)

Although around 100 kidney transplantations are performed in New Zealand each year, 350 New Zealanders are waiting for one to become available, and New Zealand has one of the lowest organ donation rates in the world (National Transplant Donor Co-ordination Office, 2003). And the problem is not just with kidneys. There is excess demand for other transplantable organs and tissue – e.g., livers, lungs, hearts, skin, corneas, pancreases and bone marrow – and the demand for organs in general is rising.⁹ This mismatch is putting increasing pressure on the health system to care for people who have to wait (often forever) for compatible organs to become available. For example, kidney dialysis treatment costs up to \$60 000 per year (Fleming, 2003).

Although living people can be donors of organs like kidneys, most donations are from brain-dead accident victims. When people apply for a driver's licence they indicate their willingness to be an organ donor. But when a person dies, doctors must still ask his or her grieving family for permission to use his or her organs. Naturally, this can be a very distressing experience for all concerned and often the discussion does not take place or the family goes against the expressed wishes of the deceased person, and so a donation is not made.

This article considers the implications of New Zealand's voluntary organ donation system, in terms of the welfare of both organ donors and recipients via the following simple model. It then considers three alternative systems that offer the possibility of more organ transplants.

A simple model of demand and supply

In Figure 4.1, the demand or marginal value ($D = MV$) curve represents the price that people who need a new kidney would be willing to pay for one. In other words, the curve shows the marginal value (MV) of kidneys to potential transplant recipients. It is relatively steep, reflecting the insensitivity (or inelasticity) of demand to price changes, because of the lack of transplant substitutes other than dialysis treatment.

The supply or marginal cost ($S = MC$) curve represents the 'price' that people would be willing to accept for supplying one kidney (from a living donor) or both kidneys (from a dead donor) for transplantation. Part of this price includes compensation to living donors for their travel expenses and lost earnings while they are recovering. It is also net of any satisfaction donors (or their families) get from helping others.

The horizontal section of the supply curve (at $P = 0$) represents the fact that some people (alive or deceased) are willing to donate their kidneys for free (i.e., without any monetary compensation). Because it is illegal to buy or sell kidneys, only these 'free' kidneys are available for transplantation. However, because demand is equal to d at this zero price ($P = 0$) there is a shortage (or excess demand) of $d - s$ kidneys. In New Zealand this shortage is reflected by several hundred people (as noted above) waiting for kidneys to become available.

Assuming that the people who receive the s kidneys are the ones who derive the most value from them,¹⁰ then the value to them (i.e., their **consumers' surplus**) is the shaded area under the demand curve out to quantity s (see Figure 4.1). Net of the cost of encouraging people to become donors (e.g., via advertising campaigns), this shaded area represents the amount of welfare generated by New Zealand's current voluntary organ donation system.

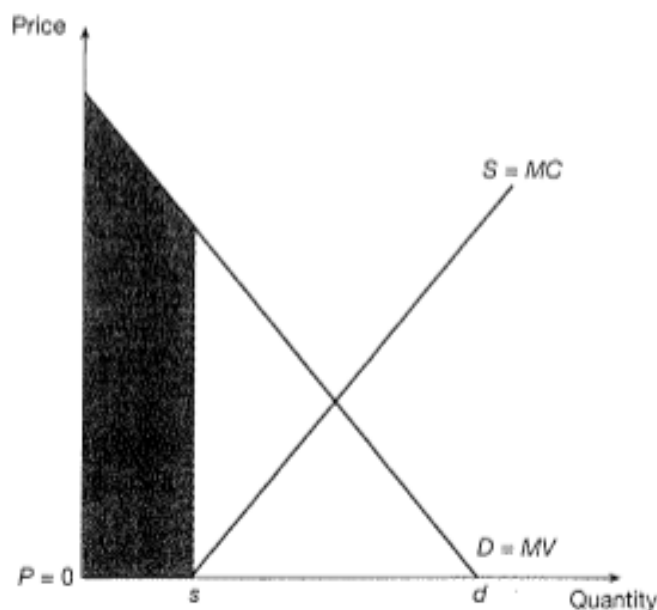


Figure 4.1 The market for transplantable kidneys – the current voluntary donation system

¹⁰ In reality, the allocation of a kidney depends on its biological compatibility with the person receiving it. How might this factor affect the amount of surplus generated by the voluntary donation system?

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Other voluntary organ donation systems

The least controversial means of achieving an increase in the supply of donated organs would be the legal requirement that doctors inform a deceased person's family that they are entitled (voluntarily) to donate the person's organs. (As discussed above, there is currently no requirement in New Zealand that doctors do this.)

This system of 'required consent', as it is known, would likely increase the supply of donated organs, as shown in Figure 4.2 by the supply curve shifting to the right, with a corresponding increase in the number of kidneys available at a zero price to s' . The kidney shortage (excess demand) would fall from $d - s$ to $d - s'$ and the total value (welfare) to transplant recipients would increase to the darkly shaded area beneath the demand curve.

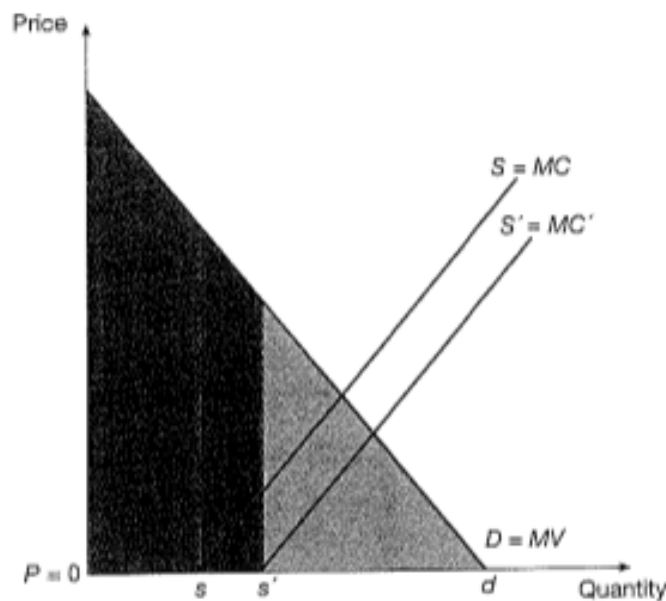


Figure 4.2 The market for transplantable kidneys – the 'required consent' and 'presumed consent' systems

More draconian is a system of 'presumed consent' whereby, by law, the organs of *all* deceased people are available for transplantation (at a zero price) unless there is an objection from the deceased person's family. Many European countries have such a system. This would ensure, if there were relatively few objections, that enough organs were donated to meet *all* demand at $P = 0$ (i.e., quantity d in Figure 4.2), thereby completely eliminating any shortage.¹¹ Moreover, this might also eliminate the need for donations from living donors. Total welfare would now be *both* shaded areas in Figure 4.2.

A system based on the 'invisible hand'

The three systems discussed above – purely voluntary, required consent and presumed consent – are all non-market solutions. What about a market-based system for procuring organs? After all, markets work well for most economic goods. How might the 'invisible hand'¹² work for procuring organs?

Figure 4.3 is a reproduction of Figure 4.1, representing New Zealand's current purely voluntary system. Recall that the shortage $d - s$ arises because a zero price does not equilibrate demand and supply. If kidneys were allowed to be freely bought and sold, the price would rise to P_e . The effect of this would be to increase the quantity supplied and decrease the quantity demanded to e .

¹¹ The supply curve for this system is not shown in Figure 4.2, but it would be to the right of the one labelled $S' = MC'$.

¹² The 'invisible hand' theorem derives from Adam Smith (1776). It is the idea that millions of self-interested individuals and firms, freely interacting in competitive markets, act as if they are led by an 'invisible hand' to produce socially desirable outcomes. However, there are special cases where markets 'fail', such as externalities, informational asymmetries and public goods, and so governments intervene to make markets more efficient.

This increases the total value to organ recipients, but now they, or someone else, such as the government, have to pay P_e , (i.e., transplants could still be free to recipients), and so their consumers' surplus is the lightly-shaded triangle. Organ suppliers now receive P_e and so their **producers' surplus** is the darkly-shaded quadrilateral. The total value to organ recipients and suppliers is the sum of these two areas.

One effect of such a system is that *voluntary* donors (who are willing to gift their kidneys for free) might be discouraged by its commerciality, such that the supply curve shifts leftwards. However, the opposite might also occur: some people might be more inclined to donate organs because they felt they were being relatively more altruistic than when organs were supplied for free.

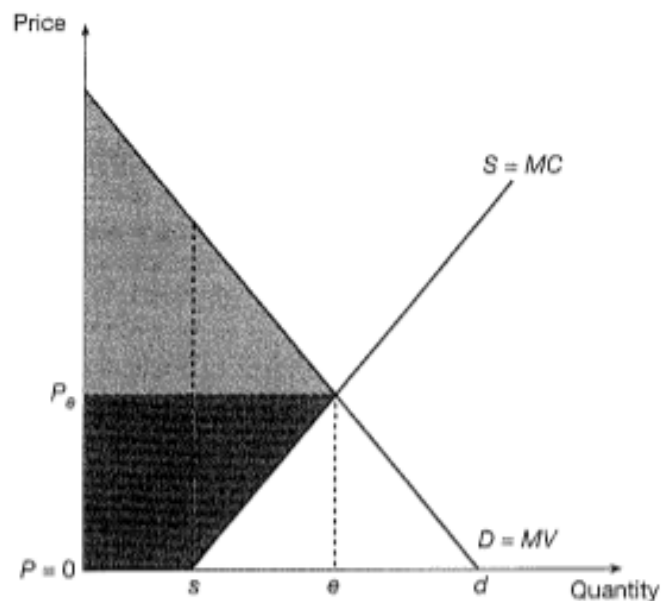


Figure 4.3 The market for transplatable kidneys – a market-based system

Rational sellers?

In general, an important requirement for a market to work efficiently is that buyers and sellers are **rational** and knowledgeable about the goods they are trading. In the present setting, can we be sure that organ sellers are rational and knowledgeable about their actions?

In fact, most sellers will be dead when their organs are sold. How can a deceased person sell something? Obviously she can't, but her family can. Or, alternatively, the deceased person could have entered into a contract when she was alive to sell her organs when she dies – i.e., a **forward contract** (in general, an agreement for the future delivery of an asset at an agreed-upon price). She could either be paid in advance (while alive) or her family could inherit the money when she dies (as with a life insurance policy).

A potentially serious concern is that paying a person's family for her organs provides an incentive for the premature termination of care if she were ill (e.g., on life support), or even murder. Obviously it would be necessary to safeguard against these possibilities, in much the same way as protecting against similar incentives created by life insurance policies. These safeguards include upholding doctors' Hippocratic oath (in essence, to do no harm to their patients) and ensuring medical staff do not have a financial interest in the deaths of patients in their care.

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**Conclusion**

The key to remedying current shortages of donated organs for transplants is to increase the quantity supplied, especially from dead donors. The three alternative systems to New Zealand's current system discussed above would probably all do this, with a consequent increase in welfare. Naturally, all four systems have different characteristics, in particular with respect to the 'voluntariness' of the donation regime and how people, including members of the medical profession, might feel about it. As for most issues of public policy, deciding which system is 'the best' is ultimately an ethical or value judgement.

**Questions**

- 1 Why does the supply curve for transplantable kidneys, as in Figure 4.1, have a horizontal section and then become upward sloping? Why is the demand curve relatively steep?
- 2 What is xenotransplantation? With the aid of a suitable demand and supply diagram (like the ones in the article), show the effect an increase in xenotransplantation and the availability of artificial organs would have on the market for transplanted (natural) organs.
- 3 Which of the four systems discussed above – purely voluntary, required consent, presumed consent and a market-based system – do you think is the best? What are some of the advantages and disadvantages of each that are *not* discussed in the article.
- 4 Blood products (for transfusions) and sperm (for infertility treatments) are also in short supply relative to demand. How is blood procured and allocated in New Zealand? How would the systems discussed in the article work for blood? Do you think the fact that blood, unlike organs, is a 'renewable resource' makes a difference to how it should be procured and allocated?

**Useful websites**

More information on organ donations in New Zealand can be found at the National Transplant Donor Co-ordination Office's website at www.donor.co.nz. Information on blood donations is available from the New Zealand Blood Service's website at www.nzblood.co.nz/.



Apocalypse maybe

[Anonymous](#). [The Economist](#); London [Vol. 338, Iss. 7959](#), (Mar 30, 1996): 74.

Sometimes governments must respond to unknown probabilities of extremely unpleasant outcomes. Can economic theory help?

BRITAIN is preoccupied with the possibility of an outbreak of Creutzfeldt-Jakob disease caused by exposure to beef infected with BSE. It is too late for policy to affect the outcome for those already exposed to the infection, but not too late to affect the rate of future exposure. In the debate about what needs to be done, economists (true to form) have so far concentrated on macro-matters such as public borrowing and the external deficit. They have been silent on a far more important question of microeconomics: how should Britain weigh the costs of attempting to eradicate BSE against the benefits of fewer exposures in future?

On the face of it, economics offers a way to think about this: cost-benefit analysis. The trouble is, although it deals with risk tolerably well, cost-benefit analysis is bad at dealing with uncertainty. To an economist, these are very different. If you know that there is a 30% chance of rain tomorrow and a 70% chance that it will stay fine, your decision about whether to carry an umbrella is subject to risk; if you have no idea whether it will rain, you face not risk but uncertainty.

The difference matters. Known probabilities allow weights to be attached to the cost of, say, getting wet in the rain. Weighted costs and benefits can be added up, and suitably discounted according to how far in the future they lie, to yield a single number: net present benefit. In theory, this allows different policies, such as carrying an umbrella, to be compared with others, such as not carrying one.

Without probabilities, such comparisons are impossible. Britain's BSE scare is a case of decision-making under uncertainty. If BSE were eradicated in a spare-no-expense way (by destroying all cattle), the possibility of further exposure would be greatly reduced. If BSE were eradicated more slowly, a greater possibility of human infection would remain. How much greater is unknown. Given this, how is the right policy to be discovered?

Decision theory has some ideas. First, write down a "cost matrix". The upper part of the table (next page) shows how this might look, using arbitrary units for illustration. Across the top are assumptions about the ability of BSE to infect humans: zero, low, medium and high. Reading down, the matrix considers three policies: do nothing, intervene mildly (selective culling) and intervene strongly (destroy all cattle).

If BSE does not infect humans and the government does nothing, the cost is zero. Assume that the gross cost of selective culling is 10, and that total destruction costs 40. That completes the first column of the matrix. Assuming no government action, suppose a low rate of infection costs 20, a medium rate 50 and a high rate 100. That completes the first row. To fill in the other cells, assume that selective culling reduces the rate of infection by 50% and that total destruction reduces it by 90%.

	Assumptions about infectivity			
	Zero	Low	Medium	High
No regrets				
Cost matrix				
Do nothing	0	20	50	100
Mild intervention	10	20	35	60
Strong intervention	40	42	45	50
Regret matrix				
Do nothing	0	0	15	50
Mild intervention	10	0	0	10
Strong intervention	40	22	10	0

In principle, the real thing could be done for BSE, based on known or discoverable facts. It would need lots more cells, and would show pounds not “units”. When you have got it (the matrix, that is) how do you use it? You can apply one of several rules. Gamblers might favour “minimin” – the minimum of minimums. This says, be lucky: go for the policy that puts the lowest cost within reach. In the pretend matrix shown here, that is “do nothing”. It offers a net cost of zero (the lowest in the matrix) so long as luck holds and infectivity is zero.

At the other extreme, a hypercautious government would prefer “minimax” – the minimum of maximums. For each policy, this asks what the worst result would be, and then chooses the policy that offers the best of these bad outcomes. It puts a floor, as it were, under disaster. The worst result for “do nothing” is 100, for mild intervention it is 60 and for strong intervention it is 50. Minimax chooses strong intervention.



A third rule seems more appealing than either of these, though it may not be obvious at first sight. It is called “minimax regret”. First you derive a regret matrix from the cost matrix. To do this you ask, for each assumption about infectivity in turn, which policy produces the best result. Then you compare the results of the other two policies with that best result, and regard the difference in cost as a measure of regret. Consider medium infectivity, for instance. The best policy is mild intervention, at a cost of 35. In the regret matrix, set that cell to zero. The cost of doing nothing, given medium infectivity, is 50, so if you chose that policy you would be 50 minus 35 worse off than under the best policy. Score 15 in the matrix. The cost of strong intervention is 45, which is 10 more than the best outcome: score 10.

Once the regret matrix is complete, apply the minimax rule as before. For each policy, what is the outcome you would regret most? For “do nothing” it is a regret of 50 (if infectivity turns out to be high); for mild intervention it is 10 (if infectivity is either zero or high); for strong intervention it is 40 (if infectivity is zero). Minimax regret chooses the policy that gives the lowest of these results. It puts a floor not under disaster, but under how bad you are going to feel if things go wrong. In this case, the rule would lead you to choose mild intervention.

Three rules, three different choices, and no firm basis for preferring one rule over another: each expresses an attitude to danger as valid as the others. But it is not quite a dead-end. Decision theory cannot create certainty where none exists, but it offers a way to organise one’s thoughts, crystallise one’s prejudices about caution and highlight the kinds of information that are needed to do better. British ministers should have their regret matrix worked out. It may be inconclusive – but it beats staring into space and thinking about mortality.