

Lung Cancer Screening

Health and Economic Ramifications of Mass CT Screening

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AGENDA

- Economic underpinnings of Screening CT
- Economics of Diagnostic Imaging
- True Market failures in screening
- Cost-Effectiveness of Screening for Lung Cancer
- Future



Economic Rationale for Lung CA Screening

- At the market level: if the benefits exceed the costs to the individual, then it is worthwhile
- This takes no account of distributive concerns (which may be addressed through tax and fiscal policy)
- Benefits include “non-economic” (utilities)
 - May include “sense” of well-being afforded by program, etc.
 - Include benefits that accrue to responsible friends, family members, etc



Economic Rationale: Employers

- Employers might offer screening to enhance productivity
 - Reduction in absenteeism
 - Reduction in presenteeism
 - Enhanced effectiveness at work
- Employers might offer screening to attract/retain employees
 - While not exactly the same thing (due to tax preferences), very similar to previous slide (i.e., this would only make sense if the individual valued this service instead of cash compensation)
- Employers might also offer screening out of a sense of paternalism



Economic rationale: Government Coverage

- Distributive concerns
 - Economically rational at the individual basis, but unaffordable
 - Tax and fiscal policy, preferentially
 - In our country, Medicare and Medicaid also attempt to correct for this
- It is in the “state’s” interest to cover such screening if
 - It reduces future costs to the program and other government service (CzRPM)
 - It enhances productivity (=output) of society
- Government coverage seldom follows economic interest
 - Generally ethical, distributive and political interests



Medicare (Proxy for Government?)

- Medicare coverage is limited to items and services that are reasonable and necessary for the diagnosis or treatment of an illness or injury (and within the scope of a Medicare benefit category).
- In general, Medicare only covers screening examinations through statutory amendments
 - BBA 1997 represented larger expansion of screening programs, but specifically (named studies/exams)
 - MMA 2003 had further expansions in screening, also specifically



Lung Cancer Screening CT

- Evidence does not answer the issues around individual or societal cost-benefit, at this time
- For some individuals, even well-informed, the utility derived from the study may warrant this intervention, however
- No current economic basis for government intervention, based on statutory language



Economics of Diagnostic Imaging

- Constrained supply of Radiologists, in this country
 - And true legal and logistic issues related to outsourcing
 - Thus, interpretation expenses show pricing (supply) power
 - However, interpretation is generally <20% of total expense for “high-tech” imaging
- Unlimited supply of equipment
 - Certificate of need (CON) laws may have limited (supply) in the past; not effective for the long run



Economics of Diagnostic Imaging

- Limited (constrained?) supply of technologists
 - Certainly in some localities, and probably broadly, a shortage of staffed CT equipment
 - CMS uses a 50% utilization rate to estimate cost
 - MedPAC suggests this number is actually much higher, in reality



Economics of Diagnostic Imaging

- What does this mean?
 - In general, CT scans have been priced above marginal cost
 - There are real concerns that even current pricing (by Medicare) could constrain supply
 - Ample evidence to the contrary, but GAO and MedPAC are appropriately cautious
 - ACR, as expected, argues that current Medicare pricing is too low



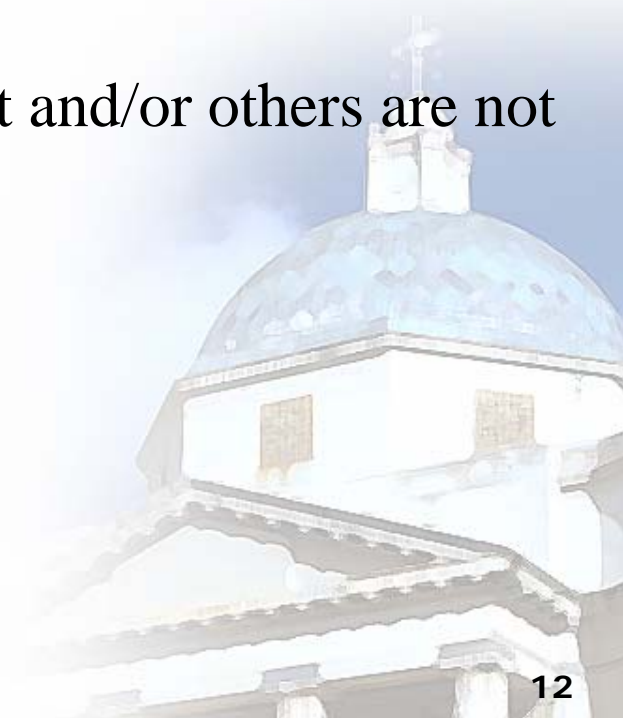
Economics of Diagnostic Imaging

- Current practice still shows ample supply-induced demand: limited price competition, at the national or regional level
- Published cost-estimates for screening are well-below market prices and, quite possibly, flawed by cost-accounting methodology
 - In addition, the lowest estimates seem to ignore professional component
 - Alternate hypothesis is that medical imaging is incredibly lucrative
 - And the market is ignoring this niche
 - Or investors are incapable of accessing this market



Bioethical Economic Concerns

- Modern Health Economics rests on premise of (Bio)ethically sound judgment
 - (Patient) Autonomy
 - Beneficence – someone (hopefully patient, but not always) benefits
 - Non-maleficence - patient and/or others are not harmed
 - Justice - fairness



Bioethical Concerns

- How does Lung CT screening stack up?
 - (Patient) Autonomy – *As long as the patient is aware of all risks, benefits, and option to opt out at any time.*
 - Beneficence – someone (hopefully patient, but not always) benefits – *Ongoing research will clarify this point. It is NOT certain, despite all of the data, that patient is truly benefiting, at present*
 - Non-maleficence - patient and/or others are not harmed - *Radiation risk and risk of False positives (and, perhaps risk of false negatives, and even risk of true negatives?)*
 - Justice - fairness – *as separate concern that is probably best left to a broader (non screening) discussion*



Where (might/does) the Market Fail?

- Information
 - Can we reliably inform our patients (partly the much larger group of patients who will fall outside of the truly (and tested) high risk groups)?
 - Younger
 - Previous smokers
 - The medical imaging vortex
 - How much prior explanation of false positive risk is required?
 - And who will bear the costs for this counseling
 - Are information pamphlets really sufficient?



Where (might/does) the Market Fail?

- Externalities
 - Positive
 - Largely considered by researchers
 - Increased productivity for those in the workforce and potentially greater utility to family members, etc.
 - Negative
 - Might risky behavior increase (i.e., would Tobacco use increase?)
 - HIV and Antiretrovirals
 - (Similarly), would negative studies deter ceasing of risky behavior?
 - Radiation Risk
 - Even low dose CT studies have potential to cause cancers
 - Much more of a threat if one extends the age range down below 60
 - Strong evidence that patients are woefully under-informed about these risks



What is the magnitude of the cost?

- 45 Million smokers in USA
- Skewed toward younger individuals (only 9% of those over 65)
- Potential high risk population could approach range above 10 million examinations, annually
 - Societal “cost” of screening likely several billion dollars annually
 - In the range of such expenditures as SCHIP program
 - Borne by (government subsidized) employee health benefit dollars and government provided program (Medicare and Medicaid).
 - Very difficult to limit coverage on anything but age



Cost-Effectiveness of Lung Cancer CT Screening

- Some estimates (Wisnivesky et al and Chirikos et al) portray favorable incremental cost-effectiveness
 - $< \$50,000$ / life-year saved; without adjustment for quality, but with sufficient latitude to suggest that, even with adjustment, the figures would be favorable
- Mahadevia et al – unlikely to be cost-effective, even with favorable outcome data (not in evidence, currently)
- All estimates have limitations, however
 - Cost of Imaging is generally chosen to be at Medicare reimbursement or below
 - Runs counter to the (questionable) argument that Medicare reimbursement is below cost



Cost-Effectiveness of Lung Cancer Screening

- All such studies have targeted high risk populations
 - Indication creep has affected every other domain of imaging and there is no reason to suggest otherwise
 - Pulmonary Embolus CT
 - Renal Stone CT
 - Thus, the actual cost-effectiveness will be less than indicated in controlled trials or models
 - All studies have assumed optimistic scenarios, as to long-term mortality-based outcomes



Where do we go?

- While cost-effectiveness is used in other countries, it is not explicitly used in the US
- Better information required before any decisions can be made
- But, from a policy stand-point, such decision making flies in the face of current debate over SCHIP funding and/or more cost-effective health and healthcare interventions.

