Medical technologies adoption in Russian public hospitals: what causes inefficiency?

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Backgrounds

The adoption of new medical technologies often generates losses in efficiency associated with

- excess, or vice versa, insufficient acquisition of new technologies,
- inadequate choice (in terms of economic and clinical parameters) of medical equipment,
- its poor use, etc.

Backgrounds -2

Russia appears to be a perfect example for exploring the problem of ineffective adoption of new medical technologies

- Public expenditure on health grew by 1.75 times in real terms from 2001-2010
- The National Project ”Health”, implemented from 2006, and the regional programs of health care modernization implemented in 2011-2013 have included massive public investments in new equipment for medical institutions.

- A lot of evidence of inefficient use of these funds
  - Typically, purchases of CT scanners for public facilities were made at prices from two to three times higher than the manufacturer's price
  - between 30-40% of high-tech medical equipment purchased for federal programs is underused or even not used at all

The main questions

- Our main hypothesis is that the key reason for inefficiency is the way the decision-making process on medical technology adoption is regulated.
- How is organized the decision-making process on the adoption of new technologies in Russian health care facilities?
- Does it differ from that in other countries (Western and BRICS)?
- What are key reasons for inefficiency?

Theoretical framework

Greer (1985) decision making models concept:

(Greer A.L. Adoption of medical technology. The hospital's three decision systems. *International Journal of Technology Assessment in Health Care* 1985. **1**: 669–680):

- **Fiscal-managerial model based on the economic efficiency rationale**
  - hospitals are motivated by marginal returns on investments and so acquire new technology only if it is economically efficient to do so
- **Strategic institutional model based on indirect benefits rationale**
  - hospitals adopt new capital-intensive medical technologies in order to improve the hospital's image and so to attract well-known physicians as well as new patients.
- **Medical-individualistic model based on clinical efficiency rationale**
  - physicians act as agents on behalf of their patients – they decide to adopt new technologies based solely on treatment considerations

Data and methods

- In-depth semi-structured interviews
  - two regions: Kaluga region and Saint-Petersburg city
  - nine public hospitals
  - 19 interviews with representatives of prominent actors (regional healthcare authorities, hospital executives, senior and staff physicians), involved in decision-making process

Actors

- Healthcare authorities (federal, regional, and local),
- Hospital executives,
- Chiefs of medical divisions (senior physicians),
- Staff physicians.

- The key decision-makers are regional authority leaders and hospitals executives:
  - Hospital executives have to justify and reconcile with regional authorities about 80% of their expenditures on equipment, devices, materials, and pharmaceuticals.
  - '*If I need to buy a medical device, I should ask the authority for permission…even if I have earned money myself*'

Motivations for technology adoption: economic rational

- Most interviewees noted that financial considerations are crucial, but
- nobody (including hospital executives) mentioned any economic and financial assessments, cost-benefits analysis, or profit maximization models;
- there is strong evidence that financial staff of hospitals does not participate in decision-making process
- Why?

Economic rational depends from the configuration of financial sources to reimburse medical treatment and technology adoption

Technology acquisition financing from	Treatment financing from:		
	Budget full coverage	Budget/CHI partial coverage	Hospital charge (OoP or insurance)
Budget (federal, regional, local)	(1)	(2)	(3)
Hospital charge	(4)	(5)	(6)

Hospitals are usually in situation 1, 2 or 3, making a financial analysis of acquiring technologies useless

Peculiarities of economic motivation of hospitals heads and physicians

- Unlike Western clinics, the interests of Russian hospital heads and physicians are driven by the possibilities to obtain income from a part of hospital activities:
  - the provision of chargeable medical services to the population,
  - as well as receiving informal payments from patients.

Motivations for technology adoption: indirect benefits

- Public hospitals operate within a strategic-institutional model of decision making and tend to adopt technologies that bring indirect benefits to their heads/physicians:
  - Attracting patients is a dominant motivation
  - Positive image attracting qualified physicians
  - Personal satisfaction as additional, though not key, motivation

Motivations for technology adoption: clinical efficacy

- An important rational, but last among motivations
  - *“We can’t yet demand the best in class technologies as the level of overall development is not the same as in Western countries. It’s impossible. We therefore choose those technologies that can be adopted here over technologies that decrease our losses and facilitate our job.”*

Discussion

- The specifically Russian feature of the decision-making process is that hospitals are strongly dependent on health authorities' decisions about new equipment acquisition.
- The inefficiency problems arise from the contradiction between hospitals' and authorities' financial motivation for acquiring new technologies:
  - hospitals tend to adopt technologies that bring benefits to their heads/physicians and minimize maintenance and servicing costs,
  - while authorities' main concern is initial cost of technology.

Discussion

- The main reason for inefficiency of medical technology adoption arises from centralization of procurement of medical equipment for hospitals that creates the preconditions for rent-seeking behaviour of persons making such decisions.
- The leading interest in this case is the size of "rolling back" due to the purchase of the equipment that makes cost-effectiveness analysis of new technologies an inappropriate tool for decision-makers.
- For the same reason, health authorities often inadequately evaluate the needs of different medical services and the possibility of health care facilities to use equipment procured for them effectively.
- This results in a consistently reproduced situation where equipment is purchased over-capacity, and thus, underused.

Conclusions

- To increase the efficiency of decision-making around medical technology adoption, the Russian government needs to shift the responsibilities of the main actors.
- The right to select and purchase medical equipment should be delegated to hospitals, while health authorities should be in charge of approval of the hospitals' development program.
- The decision-making process in Russian public hospitals must become more transparent and also take into account the growing body of international research on the relative efficiency of treatments and new technologies.