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Resolving the Coordination Problem in Health Care: Limited Responsibility HMO:s

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Abstract:

The underlying reason for the lack of coordination of health care production is often attributed to the lack of central cost accountability for each individual patient. The rather few health care producers that manages to coordinate health care all the way from primary care to tertiary care are often used as good examples, e g Veterans administration, Kaiser Permanente, Intermountain Health Care and The Mayo Clinics.

However, due to large cost variability amongst patients (economic risk), information asymmetries and agency problems, the provision of health care is rarely coordinated. More commonly, the delivery of health care production is reimbursed in a non-coordinated way that creates incentives for sub-optimisation and holds back entrepreneu**r**ship among producers.

In this paper we use data from the Medical Expenditure Panel Survey and computer simulations to illustrate that limiting a provider's cost responsibility for each patient is a much more efficient way of reducing provider risk than to increase the number of patients. Our simulations illustrate that introducing an individual yearly cost ceiling of 20 000 US-dollars per patient reduces risk as much as increasing the number of patients from 5 000 to 100 000.

The results indicate that it might be possible to create a favourable environment for coordination in managed care organisations, such as those mentioned above, without exposing providers to extensive risk. Reimbursements systems of the type used in Medicare Advantage might thus be slightly adjusted to reduce the barriers of entry (economic risk) and promote the entry of integrated care providers on the market.

JEL: C15, C53, I11, I28, L51

Keywords: reimbursement, health care, HMO, ACG, integrated care

Introduction

With the spread of HMO-like organisations within our health care systems, we will most likely see an increase in capitation arrangements for individual practices and for individual physicians. Such trends will highlight the need for risk adjustment mechanisms of the type used in the Medicare Advantage model, e g ACG (Adjusted Clinical Groups). The need to control costs will also create a need for health care organisations to delegate cost-responsibility to individual physician groups or practices.

In Europe we observe trends similar to those in the US, although from a rather different starting point. The NHS is moving – although not smoothly – from a hierarchical model to a more patient focused arrangement. The Langley health reform in England is a radical attempt to create a self-regulating system where general practitioners control about 60 per cent of the total health care expenses.

Germany has taken a slightly different route, focusing on disease management programs. An evaluation of the German disease management program for diabetes (Stock, Drabik, Graf, & Ullrich, 2010) demonstrates the advantage of integrated chains of health care delivery, as compared to traditional fee-for-service financing.

In the Netherlands, a new finance reform opens up new opportunities for providers to organise health care provision. An example is the provider organization Arts-en-zorg that tries to broaden the concept of primary care with psychologists, dieticians and physiotherapists (www.artsenzorg.nl).

The idea of integrated care – from primary care to specialist care – is closely related to the way providers are reimbursed. That is why organizational reforms are often combined with changes in the flow of financial resources. These changes can either be bonus payments or lump-sum add-ons to make it feasible and attractive for providers to change their traditional way of care provision. However, many of these initiatives are temporary and after a while things go back to the normal routines. Without project-money or special economic incentives, the new models tend to be short-lived examples of coordinated care in a sea of uncoordinated health care provision.

Although much focus has been put on creating integrated chains of care, much less interest seems to be directed towards the equally important question about how to balance risk and patient focus. This paper asserts the prospects of moving this coordination responsibility from public bureaucrats to primary care providers. But since individual patient costs may vary a lot, it may be difficult for primary care providers to take the coordinating role.

One way of limiting the financial responsibility for primary care providers when they act as coordinating units might be to limit the cost responsibility for each patient. A simple way to do that could be to set a ceiling for the costs of each patient. Primary care might then assume responsibility for all patient costs up to, say, 20 000 USD a year.

An advantage of having a cost ceiling, as compared to other models such as the UK reform, is that there is no need to create separate organizations apart from the providers to purchase downstream services, i e specialized care.

The purpose of this paper is to assess how effectively a cost ceiling can limit the economic risks for a primary care provider that has a coordinating responsibility for the entire health care chain.

The idea of a limited responsibility HMO is largely untested, although several health care reforms include elements of this basic idea. This is especially true for the Langley health reform in England, as well as the health care reform in the Netherlands in 2006.

The main reason why a model like this as yet has not been tested is, we believe, is a historic lack of systems for registering procedures, diagnoses and reimbursements for all

relevant health care providers in the delivery system. Since methods to register and debit providers based on performed procedures do exist today, we believe this type of limited responsibility arrangements are indeed possible and could be an efficient trade-off between economic integration and financial risk.

The advantage would be a greater plurality of providers and more efficient competition between providers. If an integrated provider no longer has to be as large as, for example Kaijser Permanente, integrated systems could be implemented in settings around the world.

The need for coordination in health care

Lack of coordination tends to be a problem between different levels of care due to the uncoordinated structure. Countries with predominately tax financed health care often ration by using waiting times, while insurance based systems may reduce quality, i e the time allotted for each patient.

Suboptimal behaviours, basically a consequence of reimbursement principles, in turn tend to warrant political intervention. And as politicians intervene to correct the system, the rules get even more complex. Political intervention, or expectations of political intervention, may also in itself hamper the entrepreneurial spirit of producers.

Previous research (Enthoven, 2009) illustrates the importance of a coordinated care and the advantages of putting the patient in the centre. Coordination, however, will not be possible unless someone takes the responsibility for coordinating. And to be able to coordinate, an entrepreneur must be able to gain economically from optimizing the production process.

This requires a centralised cost responsibility for individual patients. Entrepreneurship is to find and exploit inefficiencies in the care delivery process. Unless cost responsibility is reasonably centralised the gains from finding new ways of delivering care may not be possible to exploit.

A few integrated health care systems in the world are based on total cost responsibility. In the United States organisations such as Intermountain Health Care, Kaijser Permanente and The Mayo Clinics try to optimize the chain of care – from primary care to secondary care and even tertiary care.

If we turn to public insurance models we also find a small number of integrated models for reimbursement. The federal programme Medicare Advantage is based on total individual based cost responsibility, as one of few public reimbursement models in the world designed this way. The new health care financing model of the *Netherlands* has a similar structure. But generally, the health insurance models of continental *Europe* are heavily regulated and the room for providers to independently structure the provision of health care is limited, though there are examples of integrated provision for specific diseases, e g disease management programmes in *Germany*.

A recent report from the OECD Health Committee in the Directorate for Employment, Labour and Social affairs (OECD, 2011) highlights the importance of innovations that make health care more cost efficient. The report states that the structural reform of The Netherlands has generated considerable organizational innovation, particularly in such partnership forms as mergers and acquisitions, and also existing companies expanding and/or redesigning their business models in order to provide the complex mix of services that elderly patients with multiple chronic conditions require, and for which the newly re-designed financing system would now pay.

When the scope for producers is broadened, however, we often see spontaneous improvements in the delivery process. Examples can be found in the GP-fundholder systems

in Britain. GP-fundholder is a system where general practitioners get a global budget to cover most of the care needed for a specific patient. The GP is then expected to cover all costs, but can also keep any surplus.

Llewellyn (1996) takes one example from Scottish primary care. '*Through savings made on his budget he [the GP] was able to employ a community psychiatric nurse (CPN) to work from the practice premises*.'

In this example pharmaceuticals are substituted for cognitive therapy, but it could of course be the other way round. The point is that these improvements can be made without asking for permission by politicians or changing the structure of the reimbursement system.

Theoretical background

The analysis of health care markets usually starts with Kenneth Arrow's seminal article (Arrow, 1963) about the economics of medical care. Arrow states that demand for medical care is irregular and unpredictable, that the physician is expected to act altruistically, and that there is a lot of uncertainty about the quality of the product.

These special circumstances make it advantageous to organize health care in a way that allows for the physicians to act as coordinators and to limit the need to *shop around* for different health care products. But the task of coordinating health care for a patient can be difficult and the cost for health care can vary enormously.

Panzar & Willig (1981) differentiates between economics of scale and economics of scope. In health care production we find aspects of both. Health care, as any service industry, can benefit from making consumers less uncertain about the qualities of a product. Thus, we often see brand names in this sector.

Here we will primarily focus on economics of scale. One important factor that determines economies of scale is economic risk and the ability of producers to pool good and bad risks. In an environment where risks are fully insurable a small provider might be able to insure against the risk of getting a patient in need of, say, a liver transplant on its list. In reality, this will often be impossible. Moral hazard and adverse selection effectively impedes such arrangements.

Limiting risk by using high cost protection can thus be a way of reducing economies of scale and of making it feasible for small scale producers to act as coordinators in the delivery of health care. Of course, fixed capital investments and economics of scope may still provide an advantage for large scale producers.

Asymmetric information in itself may also motivate the use of lower powered incentives. As uncertainty about the true cost increases as the treatment cost increase, the economic loss due to lower powered incentives may be less than the deadweight loss of excess rent for producers (Laffont & Tirole, 1993). A cost ceiling may actually be a simplified solution to the optimization of incentives using linear programming (Lundbäck, 1997).

These questions have been analyzed both in the regulatory framework of Laffont & Tirole (Lundbäck, 2000) and the traditional model of risk aversion (Haslinger & Horgby, 1997). The literature within the field is extensive, although the brink of it has been formulated by health economists and may not be familiar to researchers outside of this field. The contributions within health economics include well cited articles such as Ma & McGuire (1997) and Newhouse (1996).

Commonly, fee-for-service (ex-post reimbursement) is set as a contrast to prospective reimbursements (ex-ante reimbursement). This setting, inspired by the American health care market, might not be fully as useful in today's health care environment where unregulated

prices are much less common and prospective reimbursements are the norm. However, the setting might also be reinterpreted as depicting the choice between setting prices for different intermediary products in the production of health and a lump-sum prospective reimbursement to cover all health care costs for an individual patient.

Setting prices for intermediary products in the production of health reduces risk, but is known to create incentives for sub optimization. According to the agency-theory (Ellis & Mcguire, 1986) the physician is assumed to act as an agent for the patient. However, this role as an agent presupposes that the physician can choose how to use the available resources to treat the patient. If the physician is constrained by reimbursement systems he or she might not be able to choose the most efficient way of using available resources.

Previous analysis of risk and provider size

The actual distribution of health care costs has been the subject of many studies (Mihaylova, Briggs, Hagan, & Thompson, 2011). Health care costs are highly skewed and known not to follow any known parametric form (Jones, 1999). Though, there is general agreement that a two parameter log-normal distribution fits the actual distribution rather well, but also that the tail end of the high cost end is thicker than assumed by the log-normal distribution (Yu, 2005). A reasonable approximation to the distribution of health care costs is the lognormal distribution with a positive mass point at zero.

French & Jones (2003) estimates a truncated lognormal distribution for health care costs in the United States and find that a lognormal distribution truncated at the 99,5th percentile describes the actual individual health care costs in the US population with sufficient accuracy.

Although the highly skewed distribution of health care costs is a known fact, the consequences of this are less analyzed. Using theoretical distributions to draw conclusions about optimal reimbursement systems is speculative, as the results depend on the properties of the distributions.

Using actual data is thus preferable and easy using simulations techniques and common programs, such as Excel and EasyFit. Our aim is to describe the effects of limiting the cost responsibility of health care producers to assess the likely effects on risk and scale economies when different high cost protection schemes are introduced. This is the first step in providing an answer to the question: Will a high cost protection scheme make it possible to create a more coordinated care process where a single provider can act as an economic coordinator of the care process?

With the internal market in UK in the beginning of the 1990:s some general practitioners were granted expanded responsibility for costs accruing to their patients elsewhere in the health care system. GP:s were given an indicative budget to cover pharmaceuticals, laboratory tests and some specialised care. The model was named GP-fundholder. There were different levels of fund holding, from the usual fund holder to the TPP (Total Purchasing Pilot). The most common fund holder model was based on cost-ceiling of 6 000 GBP a year (Martin, Rice, & Smith, 1997).

Bachmann & Bevan (1996) uses computer simulations to assess the optimal size of Total purchasing pilots in primary care. They select different risk pools and individual stop-loss ceilings of 6 000, 10 000 and 25 000 GBP respectively. Their conclusion is that not even small providers are likely to be bankrupted by assuming responsibility for in-patient costs. However, they do recommend a minimum size of 30 000 patients in the risk pool.

Crump, Cubbon, Drummond, Hawkes, & Marchment (1991) estimates the cost variation for GP-fundholders and find that small providers (9 000 patients) will have a variation of 27,5

per cent of the mean cost between the 5th and the 95th percentile. A provider with 24 000 patients will have a variation of 14.3 per cent.

Rod Jones has also presented a number of estimations of the risk associated with practice based commissioning (R. Jones, 2008). The analysis is based on inpatient cost data and information about the frequency of admission in a patient population.

So far, we are unaware of any analysis that uses actual patient cost data to assess the economic risks of providers. Because of the lack of adequate data this is not that surprising. The reasons for the lack of adequate data on patient costs may vary. Two important reasons are the integrity aspect and the fragmentation of the health care system in itself.

In this paper we use the Medical Expenditure Survey Data (MEPS) as a basis for the assessments. This dataset makes a fairly good approximation, although register data would be preferable as well as an even larger material than the 33 000 patient MEPS dataset.

The data

We use the Medical Expenditure Survey Data from 2005 as our basis for the analysis. This dataset is the most comprehensive survey about actual treatment costs available in the United States and comprises about 33 000 participants. The charges for health care and the expenditures for prescription drugs are combined to get the total treatment costs on an individual patient level.

The Medical Expenditure Panel Survey, which began in 1996, is a set of large-scale surveys of families and individuals, their medical providers (doctors, hospitals, pharmacies, etc.), and employers across the United States. MEPS collects data on the specific health services that Americans use, how frequently they use them, the cost of these services, and how they are paid for, as well as data on the cost, scope, and breadth of health insurance held by and available to U.S. workers.

Although this is a large dataset, extreme health care costs are rare events and we cannot guarantee that the material is representative in the high costs end. Assuming a functional form for the upper tail of the distribution could be a way to replicate such extreme and costly events. But since we focus mainly on expenditures below about one hundred thousand USD, we choose not to use this option.

It is important to note that MEPS is a survey, and not based on actual transactions (registers or receipts). There might be exaggerations or understatements in the data set. We do, however, observe that mean costs seem plausible for the US health care market in general. It is also commonly observed that about 20-30 per cent of the population has no health care expenses at all during a year.

About 20 per cent of participants in the survey state no health care costs at all during a year. As expected, the distribution of costs is highly skewed, with a maximum value of 1,6 million US-dollars. Only six per cent of patients cost more than 20 000 USD, but those patients account for almost 65 per cent of the total treatment costs.

(Table 1 here)

The observations in the dataset are used for simulating the actual treatment costs for patients listed with a provider. The providers are assumed to be responsible for a randomly selected number of patients. The patient stock is randomly composed by patients selected from the dataset of 33 000 observations to simulate the average cost of providers of different sizes.

The database is used without any intermediary estimation of a distribution function. That approach is most convenient, since we have no reason to believe that the costs are drawn from any specific distribution.

The random selections from the list of 33 000 patients are then made repeatedly to calculate the costs for 100 different providers of each size. The selected provider sizes (patient stocks) are 5 000, 10 000, 15 000, 20 000, 25 000, 30 000 and 50 000 respectively. Based on these simulated providers, the mean cost and SD of the mean costs for providers are calculated under several different assumptions about the providers' cost-responsibility.

The seven different options are different cost ceilings for yearly individual patient costs (in US-dollars). The fifth and sixth options are cost ceilings with the addition that providers are also responsible for ten per cent of costs above the cost ceiling. Such arrangements could be preferred if the purchaser wants to create incentives for providers to refer patients to more cost-efficient producers of in-patient care.

Results

The simulations show that a small scale provider (5 000 patients) that assumes full responsibility for the health care costs of its patients with 95 per cent probability will have less than twelve per cent higher or lower costs than the average provider (see appendix 1).

This variation, however, must be viewed against the background that providers within primary care today usually account for only about twenty per cent of the total health care costs. In practice the payer would usually only pay the net of the difference between total cost (according to our calculations) and the reimbursement. This means that as a proportion of the providers own costs and reimbursements the variation would be quite large. Compared to the present situation a variation of this magnitude would probably be difficult for small-scale providers.

As the cost ceiling is raised, the average cost increases. We also see that raising the ceiling increases the sd quite substantially. A standard deviation of 368 dollars may not sound much compared to the total average cost of health care for a patient that is slightly above 6 000 US-dollars a year. But given that the *net* reimbursement for a provider in primary care (the part that covers the providers own treatment costs) probably is somewhere in the range of 1 200 dollars per patient and year, a sd of 368 dollars mean that some percentage of providers would not be paid at all or may even have to pay for treating their patients.

This calculation does illustrate the importance of limiting risks for providers to reduce barriers of entry. A standard deviation of 99 (when a 20 000 dollar cost-ceiling is applied) is a substantial variation still, but it is much more manageable than bearing the full cost.

By introducing a cost ceiling, the cost variation can be reduced. We simulate a number of different arrangements and even a relatively high ceiling of 20 000 US-dollars a patient a year and a ten per cent responsibility above this level will reduce the standard deviation by 73 per cent.

It is difficult to judge if this reduction is sufficient to make it feasible for a 5 000 patient provider to assume cost responsibility. However, we see that the reduction in risk is comparable to that achieved by increasing the patient stock from 5 000 to about 100 000.

The figure illustrates the effects on average costs and standard deviation by introducing different cost ceilings. With a cost ceiling set at 2 000 dollars, the cost variation is quite low (about plus or minus 25 US-dollar with 95 per cent probability).

When we compare a provider with a cost ceiling of 20 000 dollar with different patient stocks we note that the effect of increasing the number of patients is rather limited. This rather surprising result is due to the extremely skewed distribution of health care costs.

(figure 1 here)

Although the figure illustrates the advantage of being a large scale provider, it is also evident that risk doesn't disappear completely. This means that the scale economies for providers with full cost responsibility remain and are significant.

Conclusions

The Medicare Advantage program in the United States forces providers to assume a large cost responsibility. Financing models where a single coordinator assumes full cost responsibility for each patient makes the optimal provider size large and creates barriers of entry for producers. Thus, in some insurance models the insurance companies are protected by a cost ceiling. In The Netherlands the ceiling is set at about 16 000 euro a year (Ministry of Health Welfare and Sports, 2008). Above this level the insurance companies bear only ten per cent of the actual cost.

The computer simulations in this paper illustrate that individual cost ceilings may be a more efficient way of limiting risk for providers of integrated care. Introducing a cost ceiling of 20 000 dollars per patient decreases the standard deviation of average cost by a factor of four, compared to full responsibility for costs.

To achieve the same reduction of risk by increasing the number of patients takes a twentyfold increase of the patient stock and is likely to make the number of patients too large for a health care provider with limited economic resources.

A counterargument might be that cost responsibility is important even for high cost patients (above i e 20 000 dollar a year). But these patients are mainly in-patients and their costs are generally reimbursed by the prevailing DRG-system. The main difference between the ACG-system, used for managed care, and the DRG-system for inpatient care is that the DRG-system is based on admissions while the ACG-system is based on expected costs during a year.

Although the DRG-model is more based on activity, the effects of relaxing the cost responsibility for the in-patient population are most likely limited. It should be noted that the DRG-model is already used by federal payers for the majority of *Medicare* patients in the United States.

Implementing a limited responsibility HMO-model may not always be straightforward, as most health care systems lack the necessary tools to measure costs, diagnoses and procedures on an individual patient level. However, to clarify the advantages of limiting the cost responsibility to make it possible to focus more on the individual patient is in itself important. This paper is an attempt to do exactly that.

References

Arrow, K. J. (1963). 'Uncertainty and the welfare economics of medical care.' *The Americal Economic Review*, *53*(5), 941–973.

Bachmann, M., & Bevan, G. (1996). 'Determining the size of a total purchasing site to manage the financial risks of rare costly referrals: computer simulation model.' *British Medical Journal*, *313*(October), 1054–1057.

Crump, B. J., Cubbon, J. E., Drummond, M. F., Hawkes, R. a, & Marchment, M. D. (1991). 'Fundholding in general practice and financial risk.' *BMJ (Clinical research ed.)*, *302*(6792), 1582–4. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1670352&tool=pmcentrez&rendertype=abstract

Ellis, R. P., & Mcguire, T. G. (1986). Provider behavior under prospective reimbursement.' *Journal of Health Economics*, *5*(2), 129–151.

Enthoven, A. C. (2009). 'Integrated Delivery Systems : The Cure for Fragmentation.' *American Journal of Managed Care*, (December), 284–290.

French, E., & Jones, J. B. (2003). 'On the Distribution and Dynamics of Health Care Costs.' *New York*, 1–23.

Haslinger, F., & Horgby, P.-J. (1997). 'High-cost protection in health insurance : a proposal for the reorganization of health insurance in the presence of asymmetric information.' *FinanzArchiv : public finance analysis*, *54*(1), 1–25.

Jones, A. (1999). Health Econometrics. *Handbook of Health Economics*. Amsterdam: North Holland.

Jones, R. (2008). 'Financial risk in practice based commissioning.' *British Journal of Health Care Management*, *14*(5), 199–204.

Laffont, J. J., & Tirole, J. (1993). *Incentives in procurement and regulation* (p. 731). The MIT press.

Llewellyn, S., & Grant, J. (1996). 'The impact of fundholding on primary health care: accounts from Scottish GPs.' *Financial Accountability and Management*, *12*(2), 125–140. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0408.1996.tb00418.x/abstract

Lundbäck, M. (1997). 'Imperfect Agency and the Regulation of Hospitals.' *The Geneva Papers on Risk and Insurance Theory*, *22*(2), 151–168. doi:10.1023/A:1008620218204

Lundbäck, M. (2000). *Asymmetric information and the production of health*. Lund University.

Ma, C. A., & McGuire, T. (1997). 'Optimal health insurance and provider payment.' *The American Economic Review*, *87*(4), 685–704. doi:10.1126/science.151.3712.867-a

Martin, S., Rice, N., & Smith, P. C. (1997). 'Risk and the GP budget holder.' *Health (San Francisco)*.

Mihaylova, B., Briggs, A., Hagan, A. O., & Thompson, S. G. (2011). 'Review of statistical methods for analysing healthcare resources and costs.' *Health Economics*, *20*(August), 897–916. doi:10.1002/hec

Ministry of Health Welfare and Sports. (2008). *Risk adjustment under the Health Insurance Act in the Netherlands*. The Hague. Retrieved from www.minvws.nl

Newhouse, J. P. (1996). 'Health Plans and Reimbursing Health in Production Providers: Efficiency Selection Versus.' *Journal of Econometrics*, *34*(3), 1236–1263.

OECD. (2011). 'Health sector innovation and partnership.' *Health Reform - Meeting The Challenge of Ageing and Multiple Morbidities* (pp. 143–172). Paris: OECD Publishing.

Panzar, J. C., & Willig, R. D. (1981). 'Economies of Scope.' *The Americal Economic Review*, *71*(2), 268–272.

Stock, S., Drabik, A., Graf, C., & Ullrich, W. (2010). 'German diabetes management programs improve quality of care and curb costs.' *Health Affairs*. doi:10.1377/hlthaff.2009.0799

Yu, W. W. (2005). 'An approximation of skewed healthcare expenditure distribution using a mixture model.' *American Statistical Association*, *ASA sectio*, 3919–3924.

Appendix A

The average patient cost and standard error of the average costs for providers with different sizes and different individual cost ceilings (USD per year).

5000 patients	**Mean**	**S D**
CEILING <2000	972	11
CEILING <5000	1733	25
CEILING <10000	2485	44
CEILING <20000	3351	74
CEILING <10000+10%	2972	70
CEILING <20000+10%	3762	99
Total cost	6169	368

20000 patients	**Mean**	**S D**
CEILING <2000	972	6
CEILING <5000	1733	14
CEILING <10000	2484	24
CEILING < 20000	3349	39
CEILING <10000+10%	2972	38
CEILING <20000+10%	3760	52
Total cost	6171	195

50000 patients	**Mean**	**S D**
CEILING <2000	972	4
CEILING <5000	1732	9
CEILING <10000	2483	16
CEILING < 20000	3347	26
CEILING <10000+10%	2969	23
CEILING <20000+10%	3757	33
Total cost	6164	114

Table 1. The distribution of total treatment costs and its components (US-dollars per year).

stats	*totexp*	*rxexp*	*hcexp*
mean	6162.8	639.6	5523.18
sd (mean)	145.12	11.19	142.88
skewness	19.43	28.40	20.14
p25	104	0	70
p50	736	30	498
p75	3445	467	2391
p90	12368	1872	10475
p95	25376	3296	23215

Figure 1. The effect of scale on risk (two sd)