

The Role of Reinsurance in Financing Children's Health Care Part I: Plan Size Effects

Faced with limited budgets and rising health care costs, many states are struggling to ensure that all children within their borders receive adequate health care. Some plans are reluctant to participate in public health care programs for children because of the large and highly variable treatment costs that can arise in caring for children, especially those with special health care needs who are enrolled disproportionately in public health insurance programs.¹ The substantial variation in treatment costs implies that even when the payments the plans receive from the states are risk-adjusted and cover expected health care costs, individual plans can suffer large financial losses if they happen to enroll children whose actual health care needs substantially exceed their expected needs.

Reinsurance, which provides health plans with protection against very high health expenditures, can reduce the variation in profit earned by health care plans participating in children's public health insurance programs. It can also limit the financial loss a plan incurs in serving individual children with unexpectedly severe needs, and can thereby limit the plan's incentive to secure favorable selection by avoiding the enrollment of children who are considered to be high risks. Reinsurance limits the share of exceptionally high health

care expenditures on a child for which the plan is responsible.² Under a common form of reinsurance, the plan bears the full cost of its expenditures on a child up to a threshold (known as the "attachment point"),

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but is responsible for only a fraction (e.g., 20 percent) of the expenditures on the child in excess of the attachment point.

Many states require health plans to purchase private or public reinsurance offered through the state.³ Moreover, there is growing interest in reinsurance products, particularly with the state and/or federal government serving as the reinsurer.⁴ The role of government in providing reinsurance for high health care expenditures is receiving attention because of the rising numbers of uninsured, the difficulty that small businesses face in offering health insurance, and increasing insurance premium costs.⁵

The focus of our study was to examine the effects of reinsurance using health care claims and encounter data from twelve health plans participating in one State Children's Health Insurance Program (SCHIP) between September 1, 2002 and August 31, 2003.⁶ The effects of reinsurance can vary according to plan size (i.e., the number of children enrolled in the plan) and according to the health status of plan enrollees. This Issue Brief explains how the key effects of reinsurance varied with plan size in our study.⁷ It is important to examine the effects of reinsurance on plan size because of the wide range of health plans that participate in SCHIP. For example, in examining the plan sizes of 35 different health plans participating in SCHIP in two states, some plans had more than 100,000 enrollees, but almost half of the plans were hospital-based or regional plans with fewer than 5,000 enrollees. Smaller plans may be less able than larger plans to sustain the financial losses associated with caring for children with special health care needs (CSHCN) because the high cost of care the small plans incur is spread across a smaller number of enrollees. Policies that limit the financial losses that can arise when caring for CSHCN can help to promote access to care for these vulnerable children.

Our study produced three major conclusions. First, even relatively modest reinsurance (i.e., a plan with a \$150,000 attachment point and 20% cost sharing above this point) can reduce substantially the largest financial loss incurred by plans of all sizes. This is the case even after health care premiums have been risk-adjusted and set at levels that cover expected health care expenditures. Second, this potential benefit of reinsurance accrues to plans of all sizes, not simply the plans that serve relatively few children. Third, although reinsurance can limit extreme financial losses, it only reduces modestly the variation in the profitability of serving individual children on average. Therefore, reinsurance may not dramatically reduce incentives for favorable selection if plans of different sizes all serve children with similar health status characteristics.

population. These premiums represent payments to the health plan by the state on behalf of the children being served. The premium for a child with a specific set of demographic and health status characteristics was set equal to the estimated health care expenditures on a child with those characteristics. In this sense, the premiums covered the average health care expenditures associated with caring for children

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Study Methodology

These conclusions were derived as follows. First, we used enrollment files and health care claims and encounter data for each of 494,103 children enrolled in the twelve plans we studied. These data sets contained information about (1) the child’s demographic characteristics, including age and gender; (2) diagnoses assigned at the time of the health care encounters, which we used to categorize the child’s health status using the Clinical Risk Groups (CRGs);⁸ and (3) the plans’ actual payments to providers for health care services rendered to the child during the sample year.

Second, we employed these data in multiple regression analyses to calculate risk-adjusted capitated payments (premiums) for the sample

with those demographic and health status characteristics. However, due to unpredictable variation in medical needs that occurs even within health status categories, a plan could not be certain that the premium it received on behalf of a child would match exactly the children’s actual health care expenditures.

Third, we calculated the net payment for each child in the sample, which facilitated our subsequent calculation of plan profit. A plan’s net payment for a child is the difference between the premium the plan receives from the state on behalf of the child and the plan’s actual health care expenditures for the child. A plan’s “profit” from participating in a children’s public health insurance program is the sum of the net payments for all of the children enrolled in the plan. Notice that

this measure of profit only includes revenues and expenditures directly associated with the delivery of health care services. This measure does not reflect advertising, marketing, capital, administrative or care coordination costs, for example.

Fourth, to examine the effects of reinsurance on plans of different sizes, we simulated plans with three distinct enrollment levels: small plans with 5,000 enrollees; medium-sized plans with 25,000 enrollees; and large plans with 150,000 enrollees. To be sure that plans differed only in size, and not in the underlying characteristics of the population they serve, each simulated plan drew its enrollees randomly from the same population – our entire sample population of children actually enrolled in SCHIP in one state. For example, a medium-sized plan with 25,000 enrollees was simulated by drawing 25,000 children randomly from the sample population.⁹ One hundred such plans of each size were simulated to provide reliable estimates of both the average impact and the range of likely impacts of reinsurance on plans of the specified size.

Reinsurance

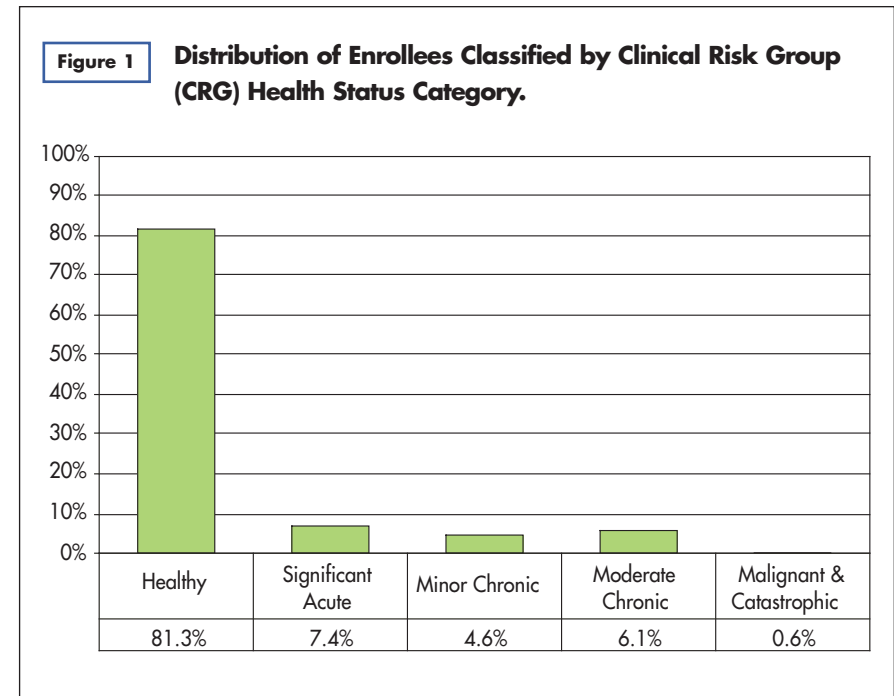
We analyzed the effects of reinsurance policies that varied according to their attachment point. Five distinct attachment points – \$25,000, \$50,000, \$75,000, \$100,000, and \$150,000 – were analyzed. The attachment point is the smallest level of health care expenditures for which some reinsurance protection is provided. The lower is the attachment point in a reinsurance policy, the greater is the financial protection the policy provides. Each of the reinsurance



policies we analyzed entailed 20% cost sharing. In other words, under the policies we considered, the plan was responsible for all covered health expenditures on a child below the specified attachment point and for 20% of the expenditures on the child above the attachment point. The reinsuring entity paid directly the 80% of expenditures above the threshold.

To illustrate these reinsurance policies in more detail, consider the reinsurance policy with a \$75,000 attachment point. Under this policy, the health plan is responsible for all of a child’s covered health care costs until expenditures reach \$75,000, and for 20% of additional expenditures. If a plan with this reinsurance policy spent \$115,000 on health care services for a child, for example, the plan would be financially responsible for \$83,000 (= \$75,000 + 20% of [\$115,000 - \$75,000] = \$75,000 + \$8,000). The reinsurer (the state) would pay directly the portion of actual expenditures for which the plan was not responsible, \$32,000 (= 80% of [\$115,000 - \$75,000] = 80% of \$40,000).

Under all of the reinsurance policies we analyzed, premiums paid to the plans were reduced to offset the state’s expected reinsurance costs, thereby making reinsurance neutral in its fiscal impact on the state’s overall costs. In other words, reinsurance did not increase the state’s expected costs, nor did it alter the overall expected profits of the health care plans.¹⁰ This funding procedure is consistent with a policy in which the state employs the savings it secures from reduced premium payments to finance special care for children with particularly pronounced health care needs. For



example, these children might be placed in a program that combines care coordination with expanded access to health care providers who specialize in the care of children with special health care needs.

Figure 1 shows the distribution of the children in our sample population among five aggregated CRG categories, representing different classifications of diagnosed health status: healthy, significant acute, minor chronic, moderate chronic, and malignant and catastrophic. Most SCHIP enrollees (approximately 81%) in our sample population fall into the “healthy” classification, while less than one percent (0.57%) fall into the malignant and catastrophic category. Although per child expenditures would be expected to vary across the CRG categories, the average frequency and magnitude of per-enrollee reinsurance reimbursements varied little across the simulated plans in our study because the simulated plans randomly drew their enrollees from

the same sample population and, therefore, had similar risk distributions.

On average, for all three plan sizes, for every ten thousand children, health care expenditures exceeded: (i) \$25,000 for nearly 17.0 children; (ii) \$50,000 for approximately 5.1 children; (iii) \$75,000 for roughly 2.3 children; (iv) \$100,000 for approximately 1.3 children; and (v) \$150,000 for roughly 0.59 children. Furthermore, the average reinsurance reimbursement per plan enrollee received by the plans was approximately \$37 (respectively, \$19, \$12, \$8, and \$5) under the reinsurance policy with an attachment point of \$25,000 (respectively, \$50,000, \$75,000, \$100,000 and \$150,000).

The Effects of Reinsurance on Plan Profits

As explained above, one important potential benefit of reinsurance is its ability to limit the particularly

large financial losses a health care plan might otherwise incur. Given our experimental design, reinsurance had little effect on average plan profit, regardless of plan size. For all plan sizes, average plan profit was close to zero under all three reinsurance policies and in the absence of reinsurance because premiums paid to the plans on behalf of children in each case approximated the plans' expected health expenditures for these children. Recall that the premiums paid to the health plans were adjusted based on the children's demographic and health

status characteristics and that the premiums were reduced in our study as reinsurance protection increased to ensure that, on average, premiums reflected the expected health care expenditures for which plans were financially liable.

While reinsurance had limited impact on the average profit from participating in a children's public health insurance program for plans of all sizes, reinsurance had substantial effects on the smallest profit earned by a plan of each size. **Table 1** and **Figure 2** describe how reinsurance affected the lowest profit

earned by each of the small, medium, and large simulated plans in our study. For clarity and simplicity, **Figure 2** presents only the impact of reinsurance with attachment points of \$25,000, \$75,000, and \$150,000. **Table 1** reports large nominal losses, especially for the large plans, which serve 150,000 enrollees. While still substantial, the losses are less pronounced when expressed on a per-enrollee basis (as explained below).

Two features of **Table 1** and **Figure 2** warrant emphasis. First, as already noted, the greatest financial loss suffered by a small plan, a medium-sized plan, and a large plan all were pronounced in the absence of reinsurance. Although a large plan experienced the greatest nominal loss (almost \$3 million) because of the large number of children it served, a small plan experienced the greatest loss per enrollee (approximately \$122 per enrollee, compared to \$49 and \$19 for the medium and large plans, respectively). These pronounced losses arose even though premiums were risk-adjusted and set to match health care expenditures, on average. Thus, even though plans of all sizes suffered neither a loss nor gain on average, the least favorable financial performance (among the one hundred simulated plans of each size) constituted a large financial loss. This loss reflects the financial outcome a plan might face in a year when it experiences a particularly unfavorable draw from the enrollee population.

Second, reinsurance reduced substantially the largest financial loss for all plan sizes. The most pronounced reduction in nominal terms

Figure 2 Percentage Reduction in Greatest Plan Loss Under Reinsurance Relative to No Reinsurance.

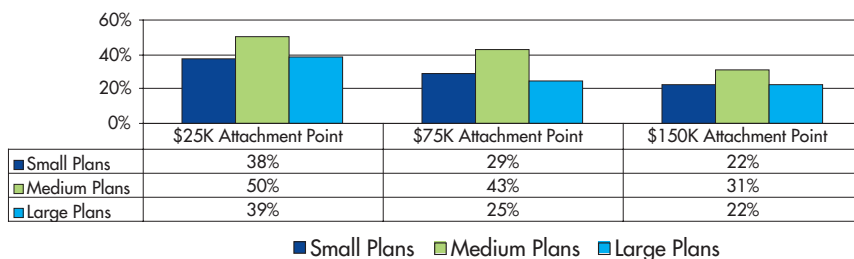


Table 1: Lowest Plan Profit With and Without Reinsurance. ¹¹

Reinsurance Attachment Point	Small Plans	Mid-Sized Plans	Large Plans
No Reinsurance	-\$610,000	-\$1,233,000	-\$2,907,000
\$150,000	-\$475,000	-\$856,000	-\$2,282,000
\$100,000	-\$461,000	-\$753,000	-\$2,246,000
\$75,000	-\$432,000	-\$700,000	-\$2,192,000
\$50,000	-\$392,000	-\$638,000	-\$2,155,000
\$25,000	-\$379,000	-\$615,000	-\$1,769,000



was the more than \$1.1 million reduction for the large plan. The most pronounced proportionate reduction (approximately 50%) occurred for the mid-sized plan.

Notice also that as the attachment point declined, the maximum financial loss incurred by a plan declined fairly systematically. For example, **Figure 2** reveals that relative to no reinsurance, reinsurance with a \$150,000 attachment point reduced the maximum financial loss incurred by a small plan by approximately 22%. The corresponding reduction secured when the attachment point is \$25,000 was 38%, an incremental reduction of sixteen percentage points. This finding suggests that while limited reinsurance coverage can provide substantial financial protection, considerable incremental protection is provided by higher levels of reinsurance (i.e., by lower attachment points).

The Effects of Reinsurance on Variability in Net Payments

In addition to limiting particularly large financial losses, reinsurance may limit incentives for favorable selection. When net payments differ substantially across children, plans can increase their earnings and reduce their financial losses by enrolling children for whom net payments are expected to be large and positive while avoiding children for whom net payments are expected to be very negative. Reinsurance can dampen a plan’s incentive to engage in such favorable selection to the

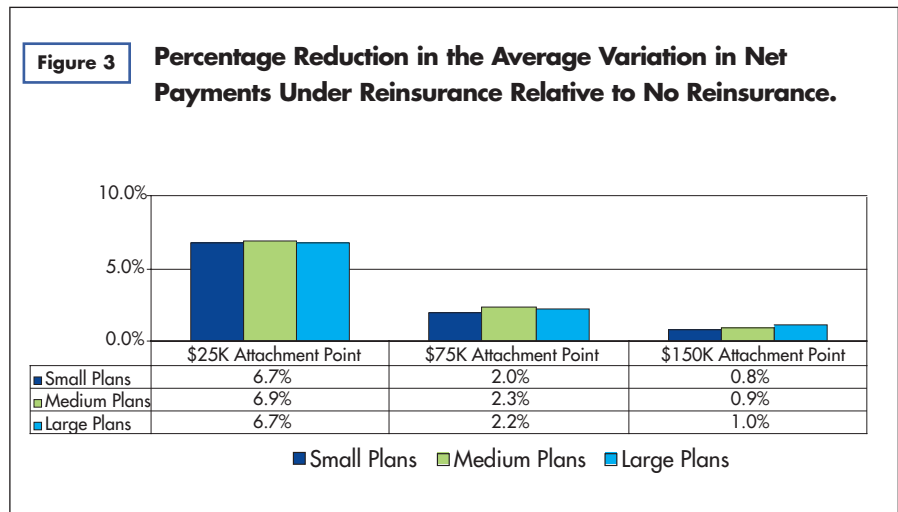


Table 2: Average Variation in Net Payments With and Without Reinsurance.

Reinsurance Attachment Point	Small Plans	Mid-Sized Plans	Large Plans
No Reinsurance	\$839	\$839	\$835
\$150,000	\$832	\$831	\$828
\$100,000	\$827	\$826	\$822
\$75,000	\$822	\$820	\$817
\$50,000	\$811	\$809	\$806
\$25,000	\$783	\$781	\$779

extent that it limits substantial variation in net payments.

Table 2 and **Figure 3** reveal the extent to which reinsurance reduced the average variation in net payments for the simulated small, medium, and large plans in our study.¹² **Table 2** identifies the nominal effects, rounded to the nearest dollar. **Figure 3** presents the corresponding proportionate effects of reinsurance on net payment variation, relative to net payment variation in the absence of reinsurance.

Table 2 and **Figure 3** reveal that reinsurance provided a systematic reduction in net payment variation for all plan sizes: the greater the reinsurance protection (i.e., the lower the attachment point), the greater the reduction in net payment variation for all plan sizes. However, the magnitude of the reduction in net payment variation was modest. Even the reinsurance policy with the \$25,000 attachment point reduced the average variation in net payments by less than ten percent.

Conclusions

In summary, our study of the effects of reinsurance produced three major conclusions.

1. Relatively modest reinsurance policies can reduce significantly extreme financial losses incurred by plans that participate in children's public health insurance programs, even after premiums have been set to cover expected health care expenditures and have been risk-adjusted to reflect demographic characteristics and health status.
2. This benefit of reinsurance can be substantial for plans of all sizes, not only for small plans that serve relatively few children.
3. Reinsurance reduces only modestly the average variation in the profitability of serving individual children. Therefore, reinsurance may not dramatically reduce incentives for favorable selection if plans of different sizes draw their enrollees from populations with very similar distributions of children's health status.

This analysis focused on the effects of reinsurance on health plans of different sizes that have similar case mixes. Reinsurance can reduce the variation in the profitability of serving individual children (and thereby limit incentives for favorable selection) more substantially when different plans attract enrollees from populations

with different case mixes. Reinsurance also can affect systematically both the average and the extreme profits of plans with different case mixes. These are among the conclusions reported in our companion Issue Brief on reinsurance.¹³ Our findings are particularly salient for the small plans serving

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fewer than 5,000 children that comprise an important component of the network of plans serving children in SCHIP and other public insurance programs. By limiting the financial risk these plans face, reinsurance may encourage them to participate in public insurance programs.

Future research will extend our study in several directions, including the following three. First, alternative reinsurance policies will be analyzed. For example, some reinsurance policies specify two expenditure thresholds. Health care plans are responsible for all expenditures on a child below the

lower threshold, but are not responsible for any expenditures above the upper threshold. The plans are responsible for a fraction (e.g., 20%) of expenditures between the thresholds. Reinsurance policies of this sort can provide greater protection against particularly large financial losses than the reinsurance policies considered in our study.

Second, possible behavioral effects of reinsurance will be analyzed. When a plan is held responsible for a smaller fraction of its health care expenditures, it may deliver expanded health care services to its enrollees. The expanded services could be of great value to the enrollees in terms of quality and outcomes of care, or they could be of little benefit. If the expanded services are of great value, reinsurance can have benefits other than those considered in our study. If the expanded services are of little value, reinsurance can have additional costs that must be weighed carefully against the potential benefits of reinsurance identified in our study.

Third, different health plans, particularly plans of different sizes, have different tolerances for financial risk. The ability of different reinsurance policies to reduce a plan's financial risk below the level it can reasonably tolerate, and thereby ensure the plan's continued operation, remains to be analyzed in detail.



References

- ¹ Children with special health care needs are defined as children “who have or are at elevated risk for chronic physical, developmental, behavioral, or emotional conditions and who also require health and related services of a type or amount not usually required by children.” Maternal and Child Health Bureau. 1995. *Definition of Children with Special Health Care Needs* Division of Services for Children with Special Health Care Needs. Rockville, MD. In 2001, an estimated 12.8% of children in the United States had a special health care need. Blumberg, S. 2003. *Comparing States Using Survey Data on Health Care Services for Children with Special Health Care Needs*. Centers for Disease Control and Prevention, National Center for Health Statistics.
- ² Lutzky, A. and Bovbjerg, R. 2003. *The Role of Reinsurance in Medicaid Managed Care*. Center for Health Care Strategies Resource Paper. Washington D.C.: The Urban Institute.
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- ⁴ Blumberg, L.J., Holahan, J. 2004. Government as Reinsurer: Potential Impacts on Public and Private Spending. *Inquiry*. 41:130-143.
- ⁵ Freudenheim, M. and Pear, R. 2004. Momentum Builds for U.S. Role in Paying Highest Health Costs. *The New York Times*. October 23, 2004.
- ⁶ The state is not identified here to help preserve confidentiality of key data.
- ⁷ Our companion Issue Brief explains how the key effects of reinsurance vary with case mix. The National Center on Financing for Children with Special Health Care Needs. *The Role of Reinsurance in Financing Children’s Health Care, Part II: Case Mix Effects*.
- ⁸ The CRGs are a categorical clinical system that classifies individuals according to their diagnosed health status. The CRGs include nine core health status groups: healthy, significant acute, minor chronic, multiple minor chronic pairs, single dominant or moderate chronic, multiple significant chronic pairs, chronic triplets, catastrophic, and metastatic malignancy. These categories can be collapsed into the following five groups for analytic and descriptive purposes: healthy, significant acute, mild chronic conditions, moderate chronic conditions, and malignant and catastrophic conditions. Neff, J.M., Sharp, V., Muldoon, J., Graham, J., Popalisky, J., Gay, J. 2001. “Identifying and Classifying Children with Chronic Conditions Using Administrative Data with the Clinical Risk Group Classification System.” *Journal of Ambulatory Pediatrics*. 2(1): 72-79.
- ⁹ The random sampling was conducted with replacement.
- ¹⁰ For simplicity in this initial study, we assumed that plans’ health care expenditures on individual children did not change as the terms of the prevailing reinsurance policy changed.
- ¹¹ The numbers in Table 1 are rounded to the nearest thousand.
- ¹² The measure of variation that we employed is the mean absolute deviation (MAD) of a plan’s net payments. This measure is the average of the differences between a plan’s net payments and its mean net payment, where all differences are expressed as absolute values. Alternative measures of variation – including variance and standard deviation – produced similar conclusions.
- ¹³ Our companion Issue Brief reviews how the effects of reinsurance vary with plan case mix, holding plan size constant. (See note 7 above.)





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