

## Long-term Care and Pay-for-Performance Programs

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September 7, 2017

### Abstract

Pay-for-performance programs are gradually spreading across Asia. This paper builds on the longer experience in the United States to offer lessons for Asia. The Center for Medicare and Medicaid Services has introduced several pay-for-performance programs in the last few years to encourage hospitals to improve quality of care and reduce costs. Some state Medicaid programs have also introduced pay-for-performance for nursing homes. Long-term care providers play an important role in hospital pay-for-performance programs because they can affect the readmission rate and also total episode payments. A good pay-for-performance program will focus on improving quality of care that affects health outcomes. In addition, that quality must vary across providers and be measurable. Furthermore, it is important that the measures be reported in a timely way, that both demand and supply respond to the measures, and that the measures be risk

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/rode.12359](https://doi.org/10.1111/rode.12359)

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adjusted. Empirical data from Medicare beneficiaries in the state of Michigan show that mean episode payments and readmission rates in skilled nursing facilities vary widely and are sensitive to the number of observations. These practical matters create challenges for implementing pay-for-performance in practice. There is an extensive literature review of pay-for-performance in long-term care in the United States and in Asia.

**Keywords:** long-term care, nursing homes, pay-for-performance, quality of care, episode, Asia

**JEL Classifications:** I11, I13, I18

**Acknowledgements:** Yubraj Acharya, Young Do, Eric Finkelstein, Chie Hanaoka, Toshi Iizuka, Joyce Koh, Ying-Chun Li, Jui-fen Rachel Lu, Marcus Ong, Hua Wang, and Zhou Yang provided information on pay-for-performance programs in Asia. John Syrjamaki cleaned the Medicare data set. Yoshihiko Kadoya provided valuable comments at the ADBI-AGRI Workshop on Aging in Kitakyushu. Their help is greatly appreciated. Support for the Michigan Value Collaborative is provided by Blue Cross Blue Shield of Michigan as part of the BCBSM Value Partnerships program; however, the opinions, beliefs and viewpoints expressed by the author do not necessarily reflect those of BCBSM or any of its employees.

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Article type : Special Issue Article

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## **Abstract**

Pay-for-performance programs are gradually spreading across Asia. This paper builds on the longer experience in the United States to offer lessons for Asia. The Center for Medicare and Medicaid Services has introduced several pay-for-performance programs in the last few years to encourage hospitals to improve quality of care and reduce costs. Some state Medicaid programs have also introduced pay-for-performance for nursing homes. Long-term care providers play an important role in hospital pay-for-performance programs because they can affect the readmission rate and also total episode payments. A good pay-for-performance program will focus on improving quality of care that affects health outcomes. In addition, that quality must vary across providers and be measurable. Furthermore, it is important that the measures be reported in a timely way, that both demand and supply respond to the measures, and that the measures be risk adjusted. Empirical data from Medicare beneficiaries in the state of Michigan show that mean episode payments and readmission rates in skilled nursing facilities vary widely and are sensitive to the number of observations. These practical matters create challenges for implementing pay-for-performance in practice. There is an extensive literature review of pay-for-performance in long-term care in the United States and in Asia.

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## **Introduction**

Pay-for-performance programs, which explicitly create financial incentives for health care providers based on measured outcomes, are gradually spreading across Asia. Pay-for-performance programs have the promise of improving quality of care, lowering total episode expenditures, and providing information to providers for continual quality improvement. They are also typically structured to be budget neutral, making them popular among policymakers. Furthermore, pay-for-performance programs are spreading into long-term care, which has special

challenges when compared to acute care because long-term care patients typically have chronic conditions and worse prognosis. Although pay-for-performance in long-term care is starting to become important in Asia, there is not yet a lot of evidence to assess the experience there. This paper therefore builds on the longer experience in the United States to offer lessons for successful pay-for-performance programs in Asia, while also reviewing the extant literature in Asia.

The Medicare insurance program, which covers elderly persons and some non-elderly disabled in the United States, is undergoing a profound change in how it pays for health care. Traditionally, Medicare has paid for most health care based on quantity of services performed. More services — visits, tests, days, drugs, and consults — means more reimbursement. Under this system, the incentives for providers are to provide more services. Quality of care is not rewarded directly. Keeping costs down, on a per-visit or per-episode basis, is not rewarded directly. Without global budgets or caps, and with managed care playing only a modest role in the entire system, the overall health care system rewards greater quantity, not greater quality of care. It is perhaps not surprising that the United States health care system is by far the most expensive in the world and, by many measures, has poor health outcomes relative to other developed nations. Nor is it surprising that recently policymakers have sought ways to change this system to reward quality of care and cost control.

In recent years, hospitals in the United States have seen several new initiatives to reward both high quality and low episode payments. These programs are generally known as pay-for-performance programs, or P4P. The Center for Medicare and Medicaid Services (CMS) now has five main pay-for-performance programs for the Medicare program. The Hospital Readmission Reduction Program (HRRP) aims to reduce the number of readmissions, which are costly and often indicate poor quality of care. The Hospital Value-Based Purchasing (HVBP) program encourages both higher quality of care and lower episode payments, where episodes of care include 30 days post discharge (Norton et al., forthcoming 2017). The Comprehensive Care for Joint Replacement (CRJ) model provides bundled payments to hospitals, physicians, and post-acute care providers for treatment of hip and knee replacement, one of the most common surgical procedures among elderly patients. The Hospital-Acquired Condition Reduction (HAC) Program penalizes the lowest performing quartile of hospitals one percent of their Medicare

revenue. The Bundled Payments for Care Improvement Initiative (BPCI) encourages care coordination by paying a fixed amount for a collection of services to treat an episode of illness.

These programs all share three important features. First, they take a more comprehensive view of treatment, encompassing not only the index hospital admission, but also the period (usually 30 days) post discharge. This creates incentives to improve coordination of care among different providers, traditionally a weakness of the United States health care system. Second, they reward better quality of care. Quality can be measured in different ways, including lower mortality, fewer readmissions, and better patient satisfaction, but the important thing is that hospitals have financial incentives to improve quality of care and outcomes. Third, they reward lower episode payments. The financial incentives for lower episode payments are different (financial penalties for readmissions in HRRP, percentage bonus for lower episode payments in HVBP, and capitation in CJR), but all in some way reward lower Medicare payments and penalize higher Medicare payments.

Taken together, these pay-for-performance programs represent a sea change in how Medicare pays for major health care episodes. No longer will providers be able to earn more money through high readmission rates, not suffer financially for enduring high mortality rates, or not be responsible in part for expensive post-acute care treatment. Hospitals must now think carefully about how to manage other providers, especially skilled nursing facilities, rehabilitation centers, and home health agencies, to improve the entire episode of care.

Furthermore, although the amount of money at state is currently modest, CMS plans to tie 85% of fee-for-service Medicare payments to quality or value by 2016 (Burwell, 2015). The trend is for more pay-for-performance in the future, not less. It is therefore imperative to understand the economic incentives in these pay-for-performance programs.

While most of the emphasis on pay-for-performance seems to be directed towards hospitals, long-term care providers are also an extremely important part of pay-for-performance programs. Long-term care providers matter both directly and indirectly. Some states have started their own pay-for-performance programs for Medicaid — the state and federal insurance program for people who fall below certain income thresholds — for nursing home care. In those states, nursing homes are directly affected by pay-for-performance. In addition, for all of the hospital pay-for-performance programs, nursing homes and home health agencies are indirectly affected because the quality and cost measures are collected over the 30-day post discharge

period. When hospitals are held accountable for what happens during the post-discharge period, they will try to find a way to hold those other providers accountable too.

This paper provides an overview of long-term care and pay-for-performance. It starts with a conceptual framework of how pay-for-performance matters for long-term care providers. The conceptual framework addresses both direct and indirect incentives. The literature review summarizes how pay-for-performance has worked thus far in long-term care settings. In addition, there is a close look at readmissions in the state of Michigan, where the private insurer Blue Cross Blue Shield of Michigan has started its own pay-for-performance program for all hospitals. This study of Michigan demonstrates the many issues and challenges in trying to measure quality of care in long-term care facilities, report the information to hospitals, and have hospitals judged in part on whether skilled nursing facilities have high quality and low cost. There is also a review of pay-for-performance programs in Asian countries.

### **Conceptual Framework**

This conceptual framework begins with a discussion of how pay-for-performance directly affects nursing homes, when the pay-for-performance program is targeted directly at the nursing homes. First, it is necessary that quality of care matters. While this may seem obvious, or tautological, it is essential that actual quality of care affects outcomes (health, satisfaction, and episode spending) in a meaningful way. One reason why this relationship in nursing homes is not always obvious is that in nursing homes, death is an expected outcome for many residents. Even high-quality nursing homes have high mortality rates. Furthermore, satisfaction of patients who have dementia may not be as responsive to actual quality as patients with no cognitive problems. But setting aside those issues, we take it as given that improved quality of care will also improve patient outcomes, including health, satisfaction, and episode spending.

Second, there needs to be variation in quality of care related to differential investments towards improvement. That is, some nursing homes need to be better than others, and nursing homes can expect to improve over time if they put forth effort. Overall quality of care in nursing homes is considered poor, but also quite variable (Grabowski and Norton, 2012). Again, this may seem obvious, but it is essential for an incentive program for there to be variation and for nursing homes to be able to improve.

Third, regulators need to be able to measure quality of care. Measuring quality of care in nursing homes is hard. As already mentioned, focusing solely on outcomes like mortality and patient satisfaction could provide misleading measures of quality of care. Process measures, such as regulatory fines or staffing, are fairly easy to measure but provide indirect measures of quality that may not be highly correlated with actual quality of care. Other measures such as quality of nurses are notoriously difficult to measure. But, if quality of care is to be rewarded, it must be measured.

Fourth, quality of care must not only be measured, but measured in a timely way and reported back to the regulator and the provider quickly. If it takes years and years to collect and report data, then there cannot be timely improvements. Using claims data usually requires a one-to two-year lag. The CMS HVBP program has a two-year lag.

Fifth, there must be response on both the demand and the supply sides to the information provided about quality of care. On the supply side, nursing homes must have incentives that are strong enough to want to improve quality of care. For example, in the CMS HVBP program, hospitals can gain performance points either by doing well on an absolute scale, or by improving, thus giving incentives to all hospitals to either improve or maintain high quality of care (Das et al., 2016). Konetzka and colleagues (forthcoming 2017) found that different weights for nursing home quality measures mattered, with larger weights not surprisingly leading to larger improvements in clinical outcomes. They also found that a simple rule for deficiencies (threshold for few or no deficiencies) was more effective than a complicated one. On the demand side, patients must respond to improved quality of care by voting with their feet and going to high-quality nursing homes (Werner et al., 2012). If there is no demand response, then there is no reason to create a program to try to improve quality of care.

Sixth, the measures of quality of care need to be risk adjusted to allow appropriate comparisons conditional on the case mix severity of patients. Without risk adjustment, nursing homes that treat sicker patients may do worse on measured quality of care, not because they are worse quality of care, but because the patient population has higher morbidity and worse expected health outcomes. Without risk adjustment, there will always be incentives for nursing homes to select healthy patients to achieve a good score through patient selection instead of through high performance.



If all six of those conditions are met, then a pay-for-performance program aimed at improving quality of care in nursing homes could work.

The payment side of pay-for-performance has somewhat different issues. Payments are relatively easy to measure because there is a paper trail. Administrative data keeps close track of all payments. The demand side response is not really relevant for Medicare or Medicaid episode payments, because consumers only respond to out-of-pocket payments (although out-of-pocket payments are usually highly correlated with insurer payments). The insurer (Medicaid or Medicare) wants lower total payments. Furthermore, payments tend to be the same for the same service, eliminating basic variation in per unit prices. However, to the extent that there is price variation (e.g., due to cost of living adjustments, teaching adjustments, inflation across years) those should be eliminated by price standardization, which assigns the same average price to the same service (Chen et al., 2017). The real issue with trying to reduce payments is how to do it in a way that does not compromise quality of care. If reducing payments means discharging too early from a nursing home, then that could lead to higher morbidity and mortality.

The economic issues and incentives for pay-for-performance programs aimed at hospitals are different. In these programs, the direct incentives are for hospitals, and nursing homes are only affected indirectly. However, the same list of six issues from above still applies. Assume that quality of care matters, that there is variation, that quality can be measured in a timely way, that there is response on both the supply and demand sides of the market, and that measures are risk adjusted. For long-term care providers, the issues are mostly about post-acute care. Because of incentives, hospitals now care about quality and episode payments, so they want to steer patients to the kind of treatment that will minimize the chance of readmissions and episode payments (at least up to 30 days). Hospitals can achieve some of this during the index hospitalization. The better the initial surgery and the better the information provided to the patient, the better the post-acute care experience.

However, there are two ways that hospitals can influence what happens during the post-acute care period (Rahman, Norton, Grabowski, 2016). First, they can steer patients to different post-acute care providers. Hospital discharge planners have enormous influence over what happens to patients upon discharge. They can nudge patients towards different types of care (e.g., home health vs. skilled nursing facility) or to different specific providers within a type of care. Second, they can try to change the way that post-acute care providers provide treatment and care.

This could be through information or threats of withholding patient referrals. The goal would be to change the practice of the provider if a patient is sent there.

These two ways of influencing post-acute care — changing the probability of the provider and changing the type of care conditional on the provider — could be done informally or done formally through contracts. At the extreme, hospitals can buy or build a nursing home, creating a hospital-based nursing home. Or they can contract with existing non-hospital-based nursing homes to try to ensure quality of care.

Having laid out the main issues facing pay-for-performance programs for long-term care providers, we next turn to a literature review of the experience of pay-for-performance. In particular, the next section addresses what pay-for-performance programs look like in terms of measures of quality, incentives, and reporting. The section also summarizes what has happened to nursing homes in practice.

## **Literature Review**

The United States is not only a pioneer in developing pay-for-performance programs for inpatient care, but it is also one of the only countries that has created pay-for-performance programs specifically for long-term care providers (Briesacher et al., 2009). As of 2010, 14 (out of 50) state Medicaid programs had enacted pay-for-performance programs or were planning them. Medicaid provides means-tested health insurance, with combined state and federal funding (Werner et al. 2010). Vermont was the first state to have a pay-for-performance program, in 2000. The nine states with existing pay-for-performance programs have about 20% of all nursing homes. The remaining five states that were planning to implement as of 2010 have about 15% of all nursing homes. Therefore, a significant fraction of nursing home residents who are covered by Medicaid are in nursing homes subject to pay-for-performance. Medicaid pays for roughly half of all nursing home days, but its reimbursement is lower than private payers by roughly 10% to 30% (Norton, 2000).

The details of the pay-for-performance programs vary widely, yet all the programs share certain core features (Werner et al., 2010). Each program employs a variety of measures to try to capture quality of care. Each state uses at least three, most at least four. Nearly all use staffing, regulatory deficiencies, and patient satisfaction. Staffing and regulatory deficiencies are easy to

measure as they are collected for other purposes. Other measures used include clinical process measures, occupancy, efficiency, and Medicaid use.

Most states assign points to nursing homes for either achieving a certain threshold or being among the highest ranked (Werner et al., 2010). Points are only awarded for top performers, not for low performers who nonetheless improve (as is often done in hospital pay-for-performance programs). One problem of this system is that it gives little incentive for a low performing nursing home to improve at the margin (Norton et al., forthcoming 2017). The amount of money spent on the financial bonuses is modest, ranging from 0.1 percent to 1.8 percent (Werner et al., 2010). An important policy question is whether the incentives have spurred improvements in quality of care or lowered overall payments.

In a large-scale study of the effects of pay-for-performance for nursing homes by eight state Medicaid agencies during the decade of the 2000s, Werner and colleagues (2013) found only a few measures improved. They found that three clinical quality measures improved. They showed that the use of restraints, development of pressure sores, and number patients in moderate to severe pain all declined. However, neither of the two structural measures — nurse staffing and number of deficiencies — that were directly linked to points improved. Other health measures either did not improve or got worse. In sum, the results were decidedly mixed and somewhat disappointing. Werner and colleagues (2013) speculate that the incentives may have been too small, the results of measures not timely enough, or that it could be necessary to provide financial incentives directly to staff instead of to the organization.

Evaluation of Medicaid pay-for-performance programs by Werner and colleagues (2016) has revealed another interesting design issue. One challenge with creating incentives is to make positive incentives for all nursing homes, including those that are starting at a high level of quality of care and those that are starting at a low level. Take a threshold system, where nursing homes that achieve a certain threshold get a bonus. If the bonus is hard to attain, so that only a small fraction of nursing homes can realistically surpass the threshold, then nursing homes that start at a low level of quality may feel that they have no chance and will not try. In economic terms, the return on investment is too great to bother investing. On the other hand, if the threshold is modest, so that some nursing homes easily surpass it, then those at the top have no incentive to improve. Werner and colleagues (2016) found exactly this last problem when

comparing results across six states. Nursing homes well above the threshold got worse, although those well below the threshold seemed to have enough incentive to try to improve.

There is only one prior peer-reviewed study that has rigorously evaluated a pay-for-performance program in nursing homes, comparing treatment and control nursing homes (Norton, 1992). The nursing homes were given monetary incentives to improve the health of nursing home residents and lower Medicaid expenditures. Results showed that the incentives improved the quality of care and reduced Medicaid expenditures on nursing homes. Furthermore, the study found that nursing homes admitted more people with severe disabilities and that their average length of their stay was shortened. This sort of pay-for-performance program is consistent with the goal of transferring more people out of hospitals and into nursing homes, which serve as a lower-cost substitute.

While most nursing home pay-for-performance programs are run by state Medicaid programs, a recent study by Grabowski and colleagues (2017) evaluated the Medicare Value-Based Purchasing Program demonstration in three states (Arizona, New York, and Wisconsin). The purpose of the program was to provide incentives to improve quality of care and lower Medicare spending. The study found no change in measured quality of care. There were declines in Medicare spending in the first year for treatment nursing homes in Arizona, and for the first two years in Wisconsin, but no change in New York or in the long run in any state. The authors also interviewed administrators and concluded that few nursing homes made any appreciable effort to change, so finding so significant results should not be a surprise. The program as designed was not effective.

As hospitals are increasingly held accountable for patients' post-discharge outcomes under pay-for-performance programs, hospitals may want to direct patients to certain skilled nursing facilities (SNFs) at discharge to better manage these outcomes. This raises the question of whether patients discharged to hospital-based SNFs have better outcomes. Rahman, Norton, and Grabowski (2016) found that hospital-based skilled nursing facility patients spent about five more days in the community and six fewer days in the SNF in the 180 days following their original hospital discharge. They found no significant effect on mortality or hospital readmission, and yet Medicare spent almost \$2,900 less on a hospital-based SNF patient in the 30 days following their original hospital discharge. The analysis controlled for selection into hospital-based skilled nursing facilities.

The research question of whether hospital-based SNFs produce better outcomes with lower Medicare payments is important given recent pay-for-performance policies that hold hospitals accountable for post-hospital discharge outcomes and spending. The results of Rahman, Norton, and Grabowski (2016) provide some support for vertical integration of hospitals and SNFs. Hospitals can consider several ways to partner with SNFs, including ownership or other contractual arrangements with freestanding SNFs. Hospital networks are currently developing strategies to develop networks of SNF partners (Maly et al., 2012; Lage et al., 2015).

CMS is committed to tying Medicare payments to the value of care delivered. One of CMS's major initiatives is the Hospital Value-based Purchasing Program (HVBP), which pays financial bonuses to hospitals based on their quality of care and the episode-based payments of care. Norton and colleagues (forthcoming 2017) argue that every Medicare patient affects their hospital's performance on a variety of quality and spending measures. The change in these measures translates directly to changes in program points and eventually to dollars of Medicare reimbursement. Every Medicare patient affects the hospital reimbursement through that patient's marginal future reimbursement. Norton and colleagues (forthcoming 2017) estimate the magnitude of the marginal future reimbursement for individual patients for each quality and efficiency measure. Their method can be generalized to any other pay-for-performance program.

One concern of all pay-for-performance programs is whether the incentives are large enough to cause hospitals to change their behavior, as was discussed in the section on conceptual framework. It is necessary that providers respond to the incentives. Norton and colleagues (forthcoming 2017) found some evidence that hospitals improved their performance over time in the areas where they have the highest marginal incentives to improve care.

The results of Norton and colleagues (forthcoming 2017) align with several of the issues presented in the conceptual framework. There is great variation across providers in the measures, and these risk-adjusted measures are strongly linked to quality of care. The measures are measurable in a fairly timely way. Finally, there is some evidence of supply-side response.

Two of the implications of rewarding quality of care over an episode of care, which requires coordination across multiple providers, are that hospitals that have already integrated with post-acute care providers will perform better, and that some hospitals will have strong incentives to integrate more with post-acute care providers (Norton et al., forthcoming 2017). For example, hospitals could strengthen integration with SNFs through mergers, acquisitions, or

informal contracts. The HVBP program is especially important for the considering coordination with long-term care providers because the HVBP applies to almost all general hospitals.

### **Empirical Work**

To investigate some of these ideas further, it is instructive to look at Medicare data on nursing home use by elderly persons. SNFs play an important role in the post-acute care of elderly persons because any Medicare beneficiary who has a hospital stay of at least three days is fully covered by Medicare for the first 20 days, and then the next 80 days are partly subsidized. Specifically, this analysis looks at two outcomes: episode payments and readmission rates, each at the level of the skilled nursing facility (SNF). From a hospital's perspective, these are the two most important outcomes that affect pay-for-performance measures that are plausibly affected by SNF quality. There is evidence that observed risk-adjusted readmission rates from a SNF back to a hospital signal differences in quality, not just patient severity (Rahman, Grabowski, et al., 2016). Hospitals want to send discharged patients to nursing homes that will have short lengths of stay and that will not readmit the patients.

Consider a hospital's discharge planning decision. If the hospital is considering discharging a patient to one of two nursing homes, and if that hospital knows that one nursing home has lower average payments for post-acute care, then they would want their patient to go to that nursing home, *ceteris paribus*. Similarly, if the hospital knew that one nursing home had lower average readmission rates, then again they would want their patient to go to that nursing home. Of course, it would be important for the measures of payments and readmission rates to be price standardized and risk adjusted. A hospital with accurate information about those important outcomes could presumably improve their pay-for-performance measures of episode payments and lower their readmission rates.

Therefore, the analysis will look at those two outcomes averaged at the SNF level. Using these data it will answer four questions. First, how much variation is there in these measures across SNFs? Second, if all SNFs with episode payments, or with readmission rates, above the overall average reduced their numbers to the overall average, how much improvement would there be? Third, how much of the variation can be explained by small sample sizes? Fourth, how correlated are the results from one year to the next?

These questions get at the essential theoretical issues discussed in the conceptual framework. It is necessary that there is variation across SNFs in measures, and that the variation be largely systematic instead of random. In short, there needs to be a high signal to noise ratio.

The Medicare data are for elderly persons in the state of Michigan, which is located among the Great Lakes in the upper Midwestern region of the United States. Michigan is the 10<sup>th</sup> largest state by population and the 11<sup>th</sup> largest by land area (see Figure 1). I obtained Medicare claims data for Michigan Medicare beneficiaries, from July 2010 through June 2015, for a total of five years.

The data set consists of all Medicare SNF episodes following a hospital stay for one of seven major conditions: joint replacement, coronary artery bypass graft (CABG), acute myocardial infarction (AMI), pneumonia, congestive heart failure, colectomy, and spine surgery. These conditions were chosen because they are common, expensive, include both surgical and medical conditions, and are used in the Michigan Value Collaborative as the main conditions used in the Blue Cross Blue Shield of Michigan pay-for-performance program. In short, these are conditions that matter from both a clinical perspective and from an economic perspective.

The data are aggregated up to the SNF level (or in some cases the SNF-year level). Due to the potential problem of small sample sizes, I eliminated SNFs that had fewer than 10 admissions during this time period, as is typically done. Because the data are originally collected at the episode level, it is possible for some individuals to appear in the data more than once. The original sample includes 194,213 SNF episodes; after excluding observations from small SNFs (many of which are not located in Michigan); the final sample has 190,174 episodes in 581 unique SNFs.

The results start with average episode SNF payments. Because the payments are price standardized, the amount of payment is basically a linear function of the number of days in the SNF. Price standardization uses the same price per day for the same service. There are no differences in payments due to cost of living adjustments, rural adjustments, teaching adjustments, or any other adjustments. However, the results are not risk adjusted. Risk adjustment would attempt to adjust for case mix, essentially rewarding SNFs that admit sicker patients by adjusting their episode payments to reflect greater expected payments. While it is possible that the results would differ with case mix adjustment, in my experience case mix adjusting nursing home use is difficult, with more severely ill patients both staying longer

(greater acuity) and staying shorter (due to death and readmission). Patients who died after being admitted to a nursing home are included in the analysis. Even without risk adjustments, the main points of the analysis remain.

The variation in mean episode payments for SNFs is wide. The interquartile range is about \$3,725 (from \$11,693 to \$15,418) (see Figure 2). The mean Medicare payments are about \$13,233, for an average of 28 days. If the SNF-level mean accurately reflects differences in SNFs in how they treat patients — and are not due to case mix differences or random variation (issues that we will explore further) — then this observed variation would be extremely important for hospitals that are trying to reduce post-acute care episode payments on SNFs. As an example, suppose that hospitals refused to send patients to SNFs with above-the-mean payments, and instead sent them to SNFs that are exactly at the mean. This is equivalent to truncating the entire distribution in Figure 2 at the mean. In that case the new mean would be only \$11,934, for a reduction of about \$1,300 or about 10%. That is, reducing the highest spending down to the mean would reduce overall spending on SNFs by about 10%.

Could some of that variation be due to small sample size? One way to explore this is to graph average SNF payments by the number of patients. We know that small samples have higher variance than large samples, but it is not obvious how large a sample one needs before the SNF-level means stabilize. The answer is that one needs several hundred observations, as shown in Figure 3. SNFs with fewer than 200 observations have wide variation, too wide to have any confidence that the estimates represent only SNF-specific quality of care. SNFs with more than 1,000 observations have small variation, but relatively few SNFs have that many. Further compounding the problem is that many pay-for-performance measures are measured on annual data, whereas the measures presented in this analysis are from a full five years. Data based on a single year would be far more variable.

Another simple way to investigate the stability of the SNF-level estimates is to plot one year's estimate against the prior year's estimate. If the estimates are a perfect signal of immutable SNF quality, then the estimates will align along the 45 degree line. If the estimates are pure random noise, with no SNF-specific information, then the estimates will form a round ball of points. The results show strong correlation (about 0.648) and with wider variation for higher values (see Figure 4). That is, the signal is fairly strong, but there is still much year-to-year variation in the measures. When limited to just hospitals with a high number of



observations, the plotted points are much more tightly grouped around the 45 degree line (results not shown).

The story is similar for the SNF-level readmission rates. Overall 30-day readmission rates are about 14.6%, meaning that about one in seven Medicare patients who go to a SNF for post-acute care following a hospitalization for one of the seven conditions listed above will be readmitted to the hospital within 30 days. To be clear, these are readmissions that occur after going to the SNF.

Again, the variation in SNF-level readmission rates is wide, with most of the variation in the range of 10% to 20% (see Figure 5). This substantial variation is based on five years of aggregated data, and could be due to both differences in SNF quality of care in avoiding readmissions, as well as unmeasured case mix and random noise. If all patients who went to a SNF with above-average readmission rates instead went to SNFs with exactly average rates, then the mean readmission rates would fall from 14.6% to 13.2%, for a decline of 1.4%, or again about a ten-percent reduction.

The variance of the estimated SNF-level readmission rates is inversely related to the number of patients, as shown in Figure 6. Again, the variance is extremely high in the many SNFs with fewer than 200 observations.

The results highlight some of the concerns and problems with pay-for-performance measures in practice. Referring back to the second and third conditions for a successful pay-for-performance program in the conceptual framework, the analysis of Michigan data shows that it is not sufficient to have variation in quality across providers (condition 2) and be able to measure that quality (condition 3). The sample size must be sufficiently large to accurately measure provider-specific quality. Small sample sizes (small per provider) will yield unstable measurements, will unfairly reward providers who happen to have an unusually favorable draw of patients. The lessons for Asia are clear. It is important to have large sample sizes per provider so that the best and worst performing providers are not just due to random chance.

### **Pay-for-Performance in Asia**

Pay-for-performance programs are still relatively new in Asia, if they are to be found at all. This section provides a literature review of pay-for-performance programs in Asia and the research studies that have evaluated them.

## Japan

In 2008, Japan began a nationwide pay-for-performance program to improve the health outcomes of stroke patients (Milstein and Schreyoegg, 2016). Hospitals are rewarded on the basis of improved clinical process measures and on patient health outcomes. Specifically, hospitals were expected to discharge at least 60% of participating stroke survivors to the community, to hospitalize at least 15% of severe stroke patients, and have at least 30% of patients show improvement in activities of daily living or functional recovery by the time of discharge (Jeong et al., 2010). When compared to other pay-for-performance programs, the Japanese stroke program has a relatively small financial incentive, with potential bonuses less than 1% and no penalties.

One study showed positive effects of Japan's pay-for-performance program on clinical process measures, but no effect on health outcomes (Inoue et al. 2011). That study also found evidence that providers selected into the program patients who are good risks for improved health outcomes.

Although Japan does now have long-term care insurance (Hanaoka and Norton, 2008), and most stroke victims are elderly, the Japanese stroke pay-for-performance program does not specifically target long-term care providers. However, Japan introduced two pay-for-performance programs for public long-term care services in April 2006. One program pays long-term care facilities an increased rate if the fraction of patients who have stroke rehabilitation exceeds a certain threshold. The other program rewards high-performing long-term care institutions that provide prevention programs through day care services. Another program was implemented just in Shiga prefecture in 2012, where providers received a bonus for better outcomes. However, Iizuka and colleagues (2017) found no overall effect on health outcomes and expenditures, but only small distributional changes towards providers with larger expected incentives.

## Korea

Korea began a limited pay-for-performance program in 2007 (Lee et al., 2012). The Ministry of Health and the Health Insurance Review & Assessment Service (HIRA) focused on two specific conditions: acute myocardial infarctions (AMI) and caesarian sections (C-sections).

Those conditions were chosen because Korea ranked relatively poorly for those two conditions among OECD countries (Milstein and Schreyoegg, 2016). The goal was to improve health outcomes and to reduce the variation across tertiary teaching hospitals. The amount of revenue at stake was up to 2%, with up to 1% bonus for high-performing hospitals and up to 1% penalty for poor-performing hospitals (Lee et al., 2012; Milstein and Schreyoegg, 2016). Only tertiary teaching hospitals were involved.

Based on the initial success with improving care for AMI and reducing the rate of C-sections in teaching hospitals, Korea decided to expand the pay-for-performance programs to include general hospitals (Lee et al., 2012). The next conditions added to the program were stroke and prophylactic use of antibiotics, but eventually the intent is to include many more conditions. Over time, there are plans to expand to more conditions and to more providers. The number of health care providers included will also expand beyond hospitals.

## Taiwan

Taiwan has several pay-for-performance programs that are targeted at specific diseases. Starting in 2001, the Bureau of National Health Insurance implemented pay-for-performance programs for diabetes mellitus, tuberculosis, breast cancer, cervical cancer, and asthma (Lee et al., 2010). Later these programs were expanded to other diseases, including hypertension and hepatitis. The patients with these diseases are mostly treated as outpatients. The providers are paid a bonus if there is significant improvement in the patient's health outcome. The bonus payments are paid to the medical institutions, not to the medical professionals directly.

The Taiwanese experience, however, exposes one major challenge in designing appropriate incentives in pay-for-performance programs. Patients are recruited into the pay-for-performance program at the request of the medical professional. Therefore, physicians can select those patients who are most likely to earn them a bonus, and exclude those patients who will not. Chang and colleagues (2012) studied the first five years of the pay-for-performance program (2001–2005) in Taiwan for patients with diabetes. Essentially all patients who were enrolled in the pay-for-performance program adhered to all process measures. This result is not that impressive, however, considering that less than half of all diabetic patients were actually enrolled in the program. Favorable selection means that the incentives to improve care were only applied to a minority of diabetes patients.

The Taiwan tuberculosis pay-for-performance program went national in 2004, although hospitals could choose whether to participate or not. Li and colleagues (2010) used that source of variation in participation to compare health outcomes of patients with tuberculosis, even though within participating hospitals only some patients were selected (non-randomly) for participation. They found significant improvement in the cure rate and the average rate of treatment for patients in participating hospitals.

Currently the National Health Insurance program in Taiwan does not cover nursing home care. Therefore, any of the pay-for-performance programs would not affect long-term care directly.

#### Singapore

The Singapore Ministry of Health is planning to try pay-for-performance for a few select procedures, initially as pilot projects. For example, starting in November, 2016, they will run a bundled payment program for hip fractures as a pilot project. Therefore, it is too early to have any results from this pilot project.

#### China

China's providers are paid almost exclusively on a fee-for-service basis. This has led to predictable concerns about providers recommending unnecessary diagnostic tests and prescribing unnecessary prescription drugs to maximize revenue (Sun et al. 2016; Yip et al. 2014). Prescription drugs account for a large fraction of revenues for hospitals and providers. There is belief that fee-for-service reimbursement has caused providers to over-prescribe. Recently, the Chinese government encouraged local governments to pilot test alternative payment methods, including pay-for-performance (Yip et al., 2014).

There are two recent studies of pilot programs in rural China. While these studies are fairly rigorous, both point out concerns about selection and political interference that may still contaminate results. Sun and colleagues (2016) found that a combination of a global budget and pay-for-performance could reduce what had been extremely high prescription drug rates under fee-for-service. These results were for Shandong Province, a relatively wealthy part of eastern China in 2011–2012. Yip and colleagues (2014) studied a different pilot program in rural Ningxia Province. That pilot program also included global budgets and pay-for-performance on

a wide variety of measures, including prescribing, spending, visits, and patient satisfaction. While the authors found a significant reduction in antibiotic prescriptions, there was only a small reduction in total spending and no change in other measures.

Like most Asian countries, there is a long-standing tradition in China of adult children caring for their aging parents. Long-term care is relatively new and still uncommon in China. There is no long-term care insurance program.

## **Challenges**

Having presented a conceptual framework for thinking about pay-for-performance programs, reviewed the literature in the United States and in Asia, and analyzed Medicare data on readmission rates and spending at the SNF level, it is clear that there are many challenges to creating an effective pay-for-performance program. There are many examples of pay-for-performance programs that have little or no demonstrated effect on quality or on health outcomes. In particular, there appear to be four main challenges.

First, it is important to choose measures of quality of care that affect health outcomes and to measure them well. Although quality of individual nurses certainly matters, measuring individual quality is nearly impossible. Instead, pay-for-performance programs have used other measures such as staffing, which is easy to measure and has been shown to be related to health outcomes, or structural deficiencies, which are also easy to measure but less correlated directly with health outcomes. Using actual rates of health outcomes, such as readmission rates to hospital or decubitus ulcer rates, raise concern about favorable selection of patients and small number variation.

Second, it is important to risk adjust the measures so that providers that care for sicker patients are not unduly penalized. Sicker patients generally have worse health outcomes. Using structural or process measures avoids some of this problem. Without proper risk adjustment, there can be severe selection, as seen in Taiwan.

Third, it is important to report the results in a timely way to policymakers, providers, and consumers. If it takes many years for the results to be reported back to the providers, then it is impossible to have timely continuous quality improvement. All stakeholders need transparent access to the data to be able to understand it and act upon it. As discussed in the conceptual framework, there needs to be a supply and demand response to better quality of care, so it makes

sense that CMS reports most of the measures publicly on the Hospital Compare and Nursing Home Compare websites.

Finally, it is important to get the incentives right. Too small and the providers will not respond because the return on investment will not be worth the effort. Too large and there is concern that providers will go to excessive lengths to game the system and to cherry-pick patients through favorable selection. Most pay-for-performance programs start with small financial incentives, perhaps as a conservative approach while learning how best to measure and report results, but overall it seems as though incentives are too small.

## **Conclusion**

Pay-for-performance will continue to grow in importance as a way for insurers to provide incentives for providers to improve quality of care and to lower episode payments. Over the first few years of the pay-for-performance programs, CMS has gradually increased the percentage of Medicare payments to hospitals that are at stake. CMS has stated that their goal is to tie 85% of fee-for-service Medicare payments to either quality or value by 2016 (Burwell, 2015). Many states now have pay-for-performance for nursing homes under their Medicaid programs. Blue Cross Blue Shield of Michigan has a required pay-for-performance program for all Michigan hospitals.

For long-term care providers in the United States, pay-for-performance has become important both directly and indirectly. In addition to the direct incentive effects by Medicaid in some states, Medicare's pay-for-performance programs for hospitals affect long-term care providers indirectly. For example, SNFs provide important post-acute care for many Medicare patients. Many outcomes during the first 30 days post discharge are subject to measure and performance bonuses or penalties. More readmissions and higher 30-day episode payments can adversely affect hospitals' bottom line.

However, many challenges remain. To be effective, the measures must be related to true quality of care or cost, have variation across providers, be measureable in a timely way, not be too noisy, and be appropriately adjusted for risk. There are problems with all of these requirements, especially for long-term care because of the nature of the quality measures. State Medicaid programs have tried to overcome these by using a mix of certain measures that have

higher validity. Hospitals are starting to merge or contract with long-term care providers to have tighter control over the treatment during the post-acute care period.

Asian countries currently rely less on pay-for-performance programs than the United States, but some are moving in that direction. Hopefully, over time we can all learn from the collective experiences and find ways to improve the measures and incentives in pay-for-performance programs in long-term care.

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Figure 1. Map of the state of Michigan (in red)



Figure 2. Histogram of the mean episode payments, by SNF.

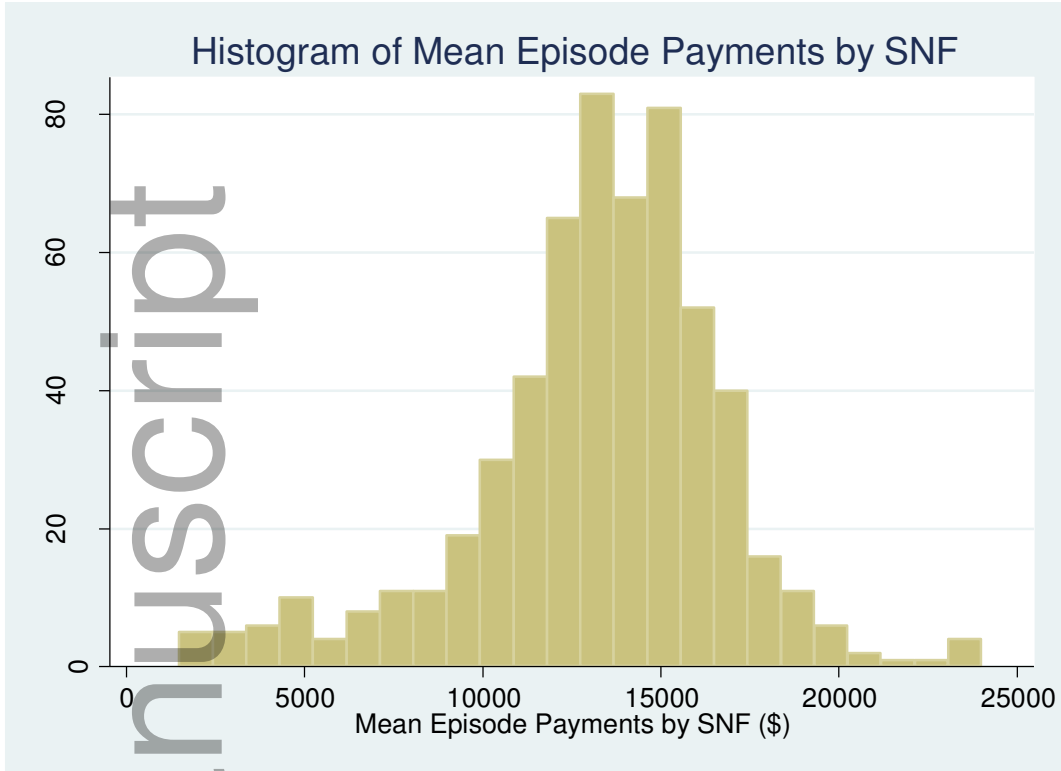


Figure 3. Mean episode payments by SNF plotted against number of patients.

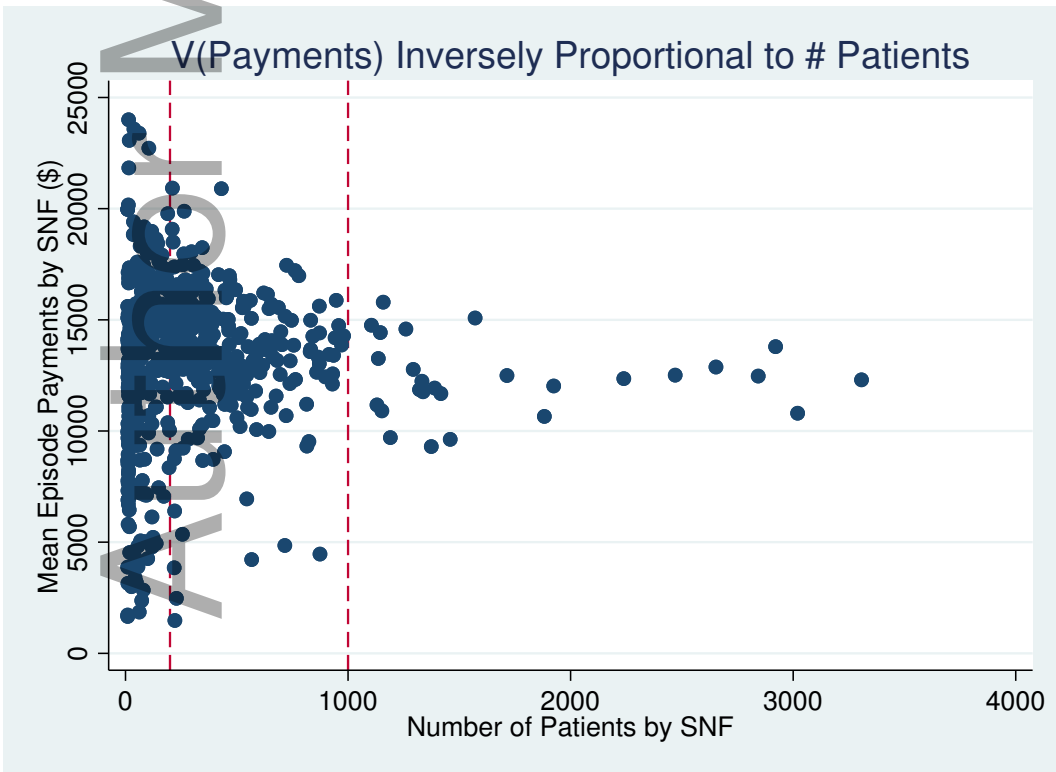


Figure 4. Mean episode payments by SNF plotted against lagged values.

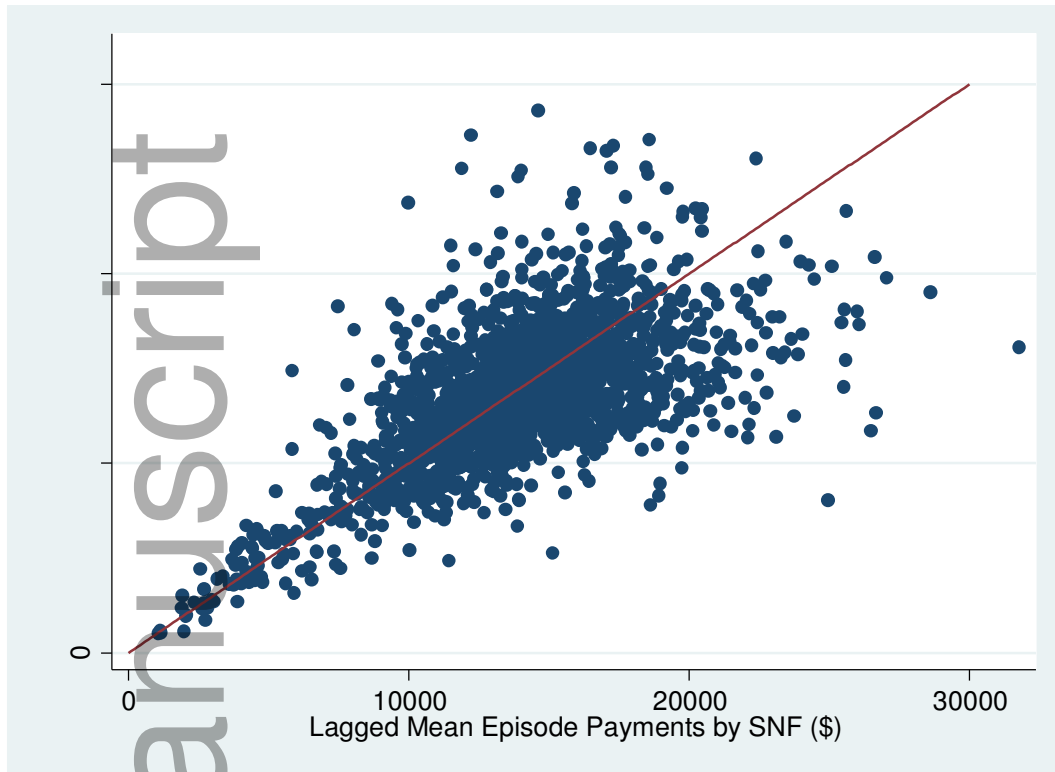


Figure 5. Histogram of mean readmission rates, by SNF.

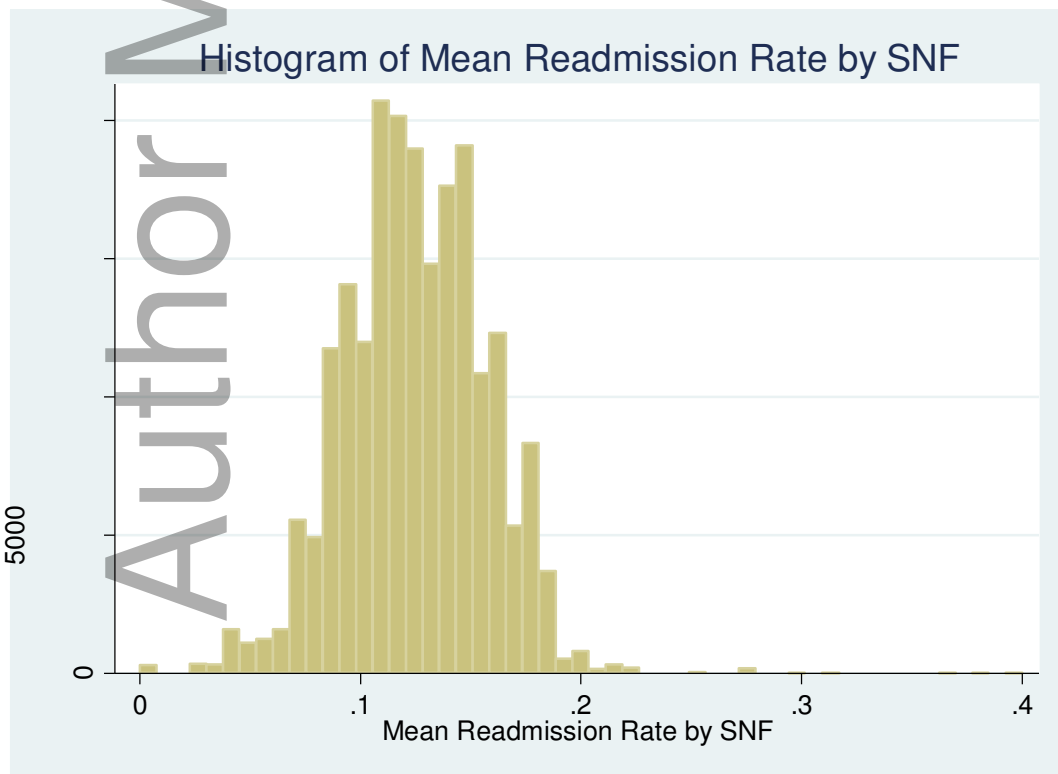


Figure 6. Mean readmission rates by SNF plotted against number of patients.

