Healthcare payment reforms across western countries on three continents: Lessons from stakeholder preferences when asked to rate the supportiveness for fulfilling patients' needs

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Abstract

Objective. To test the hypothesis that care typology – being complex and highly unpredictable versus being clear-cut and highly predictable – guides healthcare payment preferences of physicians, policy makers, healthcare executives, and researchers.

Data Sources/Study Setting. We collected survey data from 942 stakeholders across Canada, Europe, Oceania, and the United States. Forty-eight international societies invited their members to participate in our study.

Study Design. Cross-sectional analysis of stakeholder survey data linked to four scenarios of care typology: primary prevention, trial-and-error care, standard care and network care.

Principal Findings. We identified two "extremes": (1) dominant preferences of physicians, who embraced fee for service (FFS), even when this precludes the advantages of other payment systems associated with a minimal risk of harm (OR 1.85 for primary prevention; OR 1.89 for standard care, compared to non-physicians); and (2) the dominant preferences of healthcare executives and researchers, who supported quality bonus or adjustment (OR 1.92) and capitation (OR 2.05), respectively, even when these could cause harm.

Conclusions. Based on explorative findings, we can cautiously state that payment reform will prove to be difficult as long as physicians, healthcare executives, and researchers misalign payment systems with the nature of care. Replication studies are needed to (dis)confirm our findings within representative subsamples per area and stakeholder group.

Key Words. Care payment, incentive, care typology, country comparison, preferences, health system reform

INTRODUCTION

How care providers are paid is central to proposed health policy reform in the United States (US) and beyond. New proposals to support the launch of accountable care organizations (ACO) and medical homes are formulated on an almost monthly basis, with payment reform as a central component [1-5]. This evolution embodies a shift across western health systems away from traditional payment systems, such as fee for service (FFS) or salary toward wide scope prospective payment systems with risk sharing and an incorporation of clinical evidence and quality indicators in provider payment [6-15].

The key question is whether the proposed solutions will deliver on their promises after widespread implementation [16-18]. Non-delivery would imply a further exacerbation of nations' increasing care expenditures and, most likely, an enforcement of across-the-board cuts in health care with a potential risk of causing harm to patients' health.

Despite some examples of bottom-up reform, provider organizations are still guided by what many opinion leaders believe to be the crux of the problem: the use of the FFS payment system for most care, independent of its fit with patient care needs. Care providers and healthcare executives are not expected to embrace new incentives as long as the old ones dominate the healthcare market [19]. On the basis of the recent work of Richard Bohmer [19-22] and Jon Christensen and colleagues [23-24], we hypothesize that the means to cross this gap may lie in a systematic alignment of payment reform with the nature of care.

[insert Table 1 approximately here]

Although largely ignored in current payment policy, the concept of care typology may serve as the key criterion to select payment systems in an appropriate manner. The first format of care typology consists of solving highly uncertain, complex health issues mostly in an unpredictable and iterative way (see Table 1). As physicians are trained with this "trial-and-error care" scenario in mind, they mostly expect care organization and payments to be tailored to "worst case" encounters. The main payment method for trial-and-error care is FFS, which pays for all diagnosis and treatment interventions healthcare workers use to solve a complex problem in any way possible. In such circumstances the payment system can incorporate best practice guidelines or expected outcomes only to a very limited degree, since the nature of the problem implies there are few or none available. Similarly, payment cannot coordinate care, because, on the basis of complex signs and symptoms, it is impossible to determine beforehand who should be responsible for what in caring for a patient.

As Bohmer [21] and Christensen and colleagues [23] noted, however, medical progress is shifting an increasing proportion of care toward two fundamentally different formats: standard care and network care. Due to increasing scientific knowledge, a proportion of care is becoming more predictable, less complex, and more straightforward in terms of structured and sequential problem solving. Such care has the potential to be organized as a service line with guidance of appropriate care and expected outcomes. Prospective and performance-related payment incentivizes such an organization. Likewise, medical progress has enabled the creation of networks: If we know what care is appropriate and which outcomes to expect, then responsibilities can be assigned to a network of care providers organized around the patient. Supportive payment designs focus on extending the scope of incentives to include all network members that share accountability. We distinguish

a fourth "primary prevention" format, because at present it is unclear which of the three former types of care, or a combination, resembles primary prevention the most.

Within current ACO and medical home implementation, prospective and performance-related payment instruments are put forward, and FFS is gradually dismantled, without truly aligning payment with care typology. Payment reform is often dominated by non-physicians focused on managing care, even when the associated payment systems cannot be realistically implemented and may cause unintended harm through underuse of care (cf. the trial-and-error scenario). On the other hand, physicians are assumed to be "management averse." They have a higher preference for payment alternatives on the other end of the spectrum, even when reforms can be realistically implemented and intended consequences in terms of both quality and cost of care are likely to ensue with a risk of causing harm that can be actively minimized (cf. the standard and network care scenario). The aim of this study, therefore, is to compare the preferences of physicians, policy makers, healthcare executives, and researchers from western countries on three continents on seven different care payment systems to test the following hypotheses, which are expected to be true when asked to rate the supportiveness of care payment systems in fulfilling patients' needs:

1. Stakeholders prefer FFS compared to other payment systems to pay for complex, unpredictable trial-and-error care.
2. Stakeholders prefer performance-based payment more than FFS to pay for predictable standard care, for which best practice is known.
3. Stakeholders prefer prospective payment more than FFS to pay for network-based care, for which roles and responsibilities are known.

The three hypotheses above represent what would be observed if all stakeholders would apply the provider payment – care typology alignment proposed by Bohmer [21] and Christensen and colleagues [23] as part of their preference formation to fulfill patients' needs. Together these hypotheses make up the theoretical 'ideal', to mirror the preferences observed in reality. We also formulate a fourth hypothesis about the preferences we expect to see in real life, due to the impact of other considerations than care typology and the fulfillment of patients' needs:

4. Physicians have a higher preference for FFS than do policy makers, healthcare executives, and researchers, which have a higher preference for performance-based and prospective payments. We expect that these stakeholder preferences will influence the findings for hypotheses 1 to 3 toward dominant preferences, independent of care typology.

Finally, we test two contextual impact hypotheses, which are also derived from the insights described by Bohmer [21]:

5. The relationship between payment preference with respect to patients' needs fulfillment and care typology is largely independent of geographical area, a surrogate marker of health system characteristics.
6. In another health system development stage, however, we expect areas where care supply and best practice are currently less developed and less implemented to show stakeholder preferences toward a more cautious move from FFS to other payment

METHODS

The study sample

Our data stem from a 2011 survey conducted using an online platform. The study population consisted of four stakeholder groups: physicians, policy makers, healthcare executives, and researchers; the latter were experts in payment reform. Stakeholders eligible for inclusion worked in healthcare in Canada, Europe, Oceania (Australia and New Zealand), or the US. Stakeholders outside these stakeholder groups or geographical areas were excluded. We made use of a stratified sampling design based on combined stakeholder group and geographical area strata. Being explorative in nature, the study focused on detecting care payment preferences and preference differences between stakeholder groups at the level of geographical areas. The study sample was not designed to be representative of each stakeholder group and of each country or state.

Physicians, policy makers, and healthcare executives were invited to participate in the present study through their membership in 48 international societies, which served as gatekeepers (see Table 2). The societies invited all of their members or a randomized sample of their members to participate. As a fourth group, 2051 researchers were selected based on authorship of peer-reviewed papers on provider payment systems; they were invited directly by email. Multiple attempts were made to contact stakeholders who did not respond to the survey.

[insert Table 2 approximately here]

The questionnaire

Respondents were presented with four care typology scenarios: trial-and-error care,
standard care, network care, and primary prevention, as described in Table 1. A panel of 23
international experts confirmed the content validity of the scenario descriptions.

For each of the four scenarios, respondents completed a preference rating using a 1-
to-5 scale in order to state their preference for seven payment systems, as defined in Table
3. These definitions were extracted from the literature. Content validity was additionally
confirmed by the panel of international experts.

[insert Table 3 approximately here]

The main survey question was, "According to your opinion, how supportive are the
following types of physician payment systems in fulfilling patients' needs?" A rating of "1"
means "very unsupportive," whereas a rating of "5" means "very supportive."

In addition, we collected data on respondent characteristics (gender, age, seniority,
stakeholder group membership based on their current work, domains of expertise); health
system characteristics (geographical region, care payment systems in use); and, for providers
only, care characteristics (specialty/medical degree, care setting). Finally, for each scenario,
we asked care providers what proportion of patients they treat, corresponds to the
scenario's description.

Statistical analysis

Descriptive data were summarized in order to assess the coverage of stakeholder group by geographical strata of interest. We predicted payment system preference according to stakeholder group and geographical area, the two central axes of the stratified sampling plan. We used general multiple regression models, with the following independent variables: respondent characteristics (age, gender, seniority, stakeholder role, domains of expertise); health system characteristics (geographical area, care payment systems in use); and care characteristics (care setting, medical specialty). The data were analyzed using logistic regression based on the ordinal logit model. We used a generalized linear mixed modeling procedure (PROC GLIMMIX in SAS 9.2) that takes into account the multinomial distribution of the ordinal response variables and the correlation between data from the same respondent [25]. Because age and seniority were highly correlated, models included only one of these two covariates based on the highest significance level. We first estimated a comprehensive model to examine whether payment preferences were different between and within the four care typology scenarios. Then, using a stepwise backward approach, we used scenario × care payment system-specific models to estimate the relative impact of each independent variable on care payment system preference. For example, a separate model was tested for the preference for the standard care scenario, for the trial-and-error care scenario, etc. This approach allowed us to reach convergence, while being able to include key control variables.

RESULTS

A total of 942 stakeholders participated in the study. There was a balanced distribution of participant characteristics, with the exception of an overrepresentation, compared to the

proportion in the general population, of physicians working in teaching hospitals (37%) and some medical specialties. This confirmed the need for statistical control for these variables during the analysis (see Table 4).

[insert Table 4 approximately here]

In response to the question, "What proportion of the patients you treat present with this type of care needs?" participating physicians estimated care scenario prevalence at a median of 20% (interquartile range [IQR] 25) for trial-and-error care; 50% (IQR 55) for standard care; 15% (IQR 26) for network care; and 10% (IQR 30) for primary prevention. General payment system preferences per scenario across all stakeholder groups and geographical areas appear in Table 5.

[insert Table 5 approximately here]

For trial-and-error care, as theoretically expected, a higher preference for traditional payment systems, such as FFS and salary, was observed, together with a lower preference for prospective and performance-related systems. A majority of 51.9% of the respondents supported quality of care bonus or adjustment use, which was rather unexpected.

If presented with a standard care scenario, respondents shifted their preferences in line with theory, giving higher support for performance-related payment (61.9% for quality of care bonus or adjustment, 53% for evidence-informed case rates [ECRs]) and for prospective payment (56.6% for episode-based payments). This, however, was not the case for warranty use (79.3% against) and capitation (76% against). In addition, it is remarkable that the shift was accompanied by a higher preference for FFS use in a standard care scenario (75.9% support) compared to the trial-and-error scenario (69.8% support).

The network scenario showed a decrease in FFS preferences (but remained at a majority level of support at 56%) and performance-related payment systems gained support, except for warranty. Capitation and episode-based payment gained some support, but remained at a minority level of support at 37.3% and 41.5%, respectively. Salary received the highest preference in the network scenario (67.1% support).

The preferences for the primary prevention scenario corresponded, as expected, to a mixture of the standard and network care results: The respondents preferred salary and ECRs at the standard care level and other payment systems at or beyond the network care level of support. Most remarkable, but in line with expectations, was the highest preference for quality of care bonus or adjustment (68.7% support).

Across scenarios, traditional care payment systems such as salary and FFS ranked first in overall preference. Performance-related payment systems ranked second, just ahead of prospective payment systems. Adjusting the panel's preferences for differences in gender, age, seniority, geographical region, domains of expertise, care payment systems in use, specialty/medical degree, and care setting resulted in the following outcomes per stakeholder group (see Table 6).

[insert Table 6 approximately here]

Physicians had a higher preference, compared to non physicians, for FFS for standard care (OR 1.89) and primary prevention (OR 1.85). They were relatively more against prospective payment for standard care (OR 0.42 for capitation; OR 0.51 for episode-based payment) and network care (OR 0.51 for capitation; OR 0.41 for episode-based payment). Physicians were also relatively more against performance-related payment (OR ranging from 0.26 for warranty use in network care to 0.57 for quality bonus or adjustment in primary

prevention). The preferences of policy makers, compared to other stakeholder groups, varied more in line with predictions: Less FFS for standard care (OR 0.44) and primary prevention (OR 0.54); more capitation for network care (OR 2.08) and primary prevention (OR 1.89). Although some healthcare executive preferences for the trial-and-error scenario were consistent with predictions (against episode-based payment, OR 0.54), healthcare executives had an unexpectedly higher preference for bonus or quality adjustment (OR 1.92), compared to non healthcare executives. Researchers were mainly more against FFS than non researchers (OR ranging from 0.45 for trial-and-error care up to 0.54 for primary prevention), except for standard care, where such an opposition would actually be more expected. They also had a relatively higher preference for salary in standard care (OR 1.87) and primary prevention (OR 1.71). Finally, researchers had a higher unexpected preference for capitation to pay for trial-and-error care (OR 2.05), compared to other stakeholder groups.

[insert Table 7 approximately here]

At the geographical area level (see Table 7), the preferences of Canadian stakeholders did not significantly differ from the main results. Stakeholders in Oceania had a higher than overall preference for salary to pay for standard care (OR 2.10), compared to stakeholders in other areas. However, for stakeholders in Eastern Europe, the results were most striking. With regard to paying for trial-and-error care, their preferences were generally more against salary (OR ranging from 0.20 for primary prevention up to 0.32 for network care), but more supportive of all other payment systems, such as episode-based payment (OR 3.73), capitation (OR 3.53), quality bonus or adjustment (OR 9.43), and warranty (OR 5.46). The only exception was FFS, which showed no significant difference between

geographical areas. In line with theory, stakeholders in Western Europe showed a lower than overall preference for FFS to pay for standard care (OR 0.39), compared to their non Western European peers. However, inconsistent with theory, Western European stakeholders, like their Eastern European colleagues, had a higher preference for capitation (OR 2.48) and quality bonus or adjustment (OR 2.27) to pay for trial-and-error care. Finally, stakeholders in the US had a relatively higher preference against capitation (OR 0.44) for network care, compared to other areas. They also supported quality bonus or adjustment for standard care more (OR 1.77).

The contextual variables for which we controlled had in many scenarios a significant impact on stakeholder preferences for payment. We illustrate this with the results for 'care payment system in use'.

If salary, capitation and/or a quality bonus or adjustment was the payment system already in place, significant relations with payment preferences had to be taken into account at a p level below 0.05.

Stakeholders with salary experience in care payment showed a dominant preference for salary use and against FFS use, across all care scenarios. The OR ranged from 1.44 up to 1.87, and from 0.50 up to 0.67 respectively.

Stakeholders with current capitation were more in favor of capitation for network care only (OR 1.59). In addition, they were more against FFS for trial-and-error care (OR 0.61) and salary use for both standard and network care (OR 0.51 and 0.55). Capitation experience was also associated with a stronger preference for the use of a quality bonus or adjustment for standard care (OR 1.58) and ECR use in primary prevention (OR 1.49).

Experience with a quality bonus or adjustment was related to a higher support of such a payment system for primary prevention (OR 1.72) and a stronger opposition against FFS for standard and network care (OR 0.60 and 0.47).

For FFS, episode-based payment, warranty and ECRs as payment systems in place no significant relations with preferences were retained after multivariate modeling.

DISCUSSION

To the best of our knowledge, this is the first study to assess whether preferences of different stakeholder groups can be aligned by making payment policy dependent on care typologies. We examined this proposition by studying preferences with respect to the supportiveness of care payment systems to fufill patients' needs across western countries on three continents, focusing on four scenarios: trial-and-error care, standard care, network care, and primary prevention. The main results partially confirm the suggestion by Bohmer [21] and Christensen and colleagues [23] to align FFS and salary with complex, unpredictable care (trial-and-error) (hypothesis 1) and to apply performance-related payments to the other scenarios (hypothesis 2), with the exception of warranty use. Yet, inconsistently, the respondent panel generally did not support the use of prospective payment systems for more straightforward and predictable care (hypothesis 3), but continued to support FFS and salary use for non-trial-and-error scenarios (hypotheses 2 and 3). At the level of stakeholder groups, we identified two "extremes": (1) the dominant preferences of physicians, who embraced FFS, even when this precludes the advantages of other payment systems that are

associated with a minimal risk of harm; and (2) the dominant preferences of managers and researchers, who supported non-FFS and salary systems, even when these could cause harm through underuse. This confirmed hypothesis 4.

As accurately noted by one of the external reviewers, not implementing prospective and/or performance based payment when care is sufficiently predictable, may also cause harm as a consequence of overuse. Next to unnecessary patient discomfort and safety issues, society is increasingly confronted with the 'harm' of the opportunity cost of the resources consumed by wasteful care.

In our opinion, the opposite preferences demonstrate the fact that many stakeholders from different groups are insufficiently aware of the need to balance payment through care typology alignment. As long as some non-physicians propose payment changes in a linear manner that conflicts with the primary objective of medicine—that is, to minimize the risk of harm—and constrain autonomy in scenarios that should not be constrained, it is understandable that physicians continue to defend their FFS and salary preference. In addition, we observed that stakeholders in Europe, that is, mostly those in Eastern Europe, supported more the unrealistic and potentially harmful selection of payment systems for trial-and-error care, contradicting hypothesis 5 and 6. This confirms recent empirical findings about inappropriate payment implementation in this region, resulting in unintended consequences [26].

Our results should be interpreted with caution, because of the following limitations. First, our findings were based on scenario evaluations, not on real-life observations. Thus, we cannot be certain that the self-reported preferences could guide actual decision making. Second, we focused on large geographical areas, not on individual countries or states. Due to

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sample size limitations, existing differences between stakeholder groups and geographical areas could have remained undetected. Yet, both (1) the large number of significant differences in payment preferences for Eastern Europe compared to other regions, and (2) the low number of significant differences between the other regions confirm that the appropriateness of payment selection, next to care typology, is also dependent on the development stage of the health system, as predicted by Richard Bohmer [21]. Furthermore, of the more than 100,000 persons who had the opportunity to read our invitation to participate in the present study through email, newsletters, or websites, only 942 became participants. The sample, therefore, is most likely to represent motivated, early responders. However, we controlled in our analysis for an extensive set of potential confounders at the respondent, health system, and care levels.

Similarly, based on the current findings we can only formulate preliminary conclusions for each stakeholder group as a whole, and not for subgroups. For example, the pattern detected for physicians is not able to uncover more refined differences within this stakeholder group. One possibility would be a bimodal distribution of clinician opinion, namely that specialists, who have done very well under fee for service, want it to continue, while primary care physicians, who have not been well served by fee for service, might prefer an alternative mode of payment. Examining such hypotheses requires a more balanced sampling of each of the medical specialties, with sufficient primary care participation in each of the geographical areas.

Finally, prospective payment is sometimes implemented with and sometimes without risk adjustment. Also, the accuracy of risk adjustment may be different between and within health systems. We therefore cautiously included a possible risk adjustment statement in

the definition of prospective payment systems, leaving it up to the participants themselves to judge whether or not the risk adjustment condition is appropriately fulfilled. This will likely have influenced results. Future research should disentangle how risk adjustment concerns influence payment preferences by stakeholder role and health system.

CONCLUSION

Our findings indicate that care providers, policy makers, healthcare executives, and researchers could reach a shared understanding and starting point for reform by putting care typology at the center of payment policy. Physicians could recognize the value of non-FFS and salary payments for a large portion of care (e.g., estimated up to 50% for standard care by participating physicians), whereas other stakeholders could acknowledge the continuing value of FFS and salary for care, which is less predictable. Recent across-the-board cuts in Greece have led to dramatic health consequences for its citizens [27]. We should learn from this by reforming healthcare in a balanced way, making care typology a linking pin of central importance. At present, it is unclear whether ACOs, medical homes, and similar reforms in other countries connect payment selection to care typology.

Future research should focus on how to discern care typologies as an integrated part of health and payment systems, based on an optimal combination of existing tools such as best practice guidelines, variance analysis, exception reporting, and care outlier identification. In these matters, each stakeholder group brings unique expertise to the table.

Preference studies at the country and state levels are needed in order to replicate and refine our findings, with the goal of further minimizing self-selection bias. This includes a further breakdown by medical specialty: primary care vs. procedural specialty vs. non-procedural specialty.

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TABLES

Table 1: Definitions of Care Typology Scenarios*

Trial-and-error care A number of patients present with signs and symptoms in a less structured way. These

complex medical cases often require specialized diagnostic work. The co-occurrence of multiple disorders or unanticipated complications sometimes clouds a uniform diagnosis. The physician generates a number of likely hypotheses, which are tested by the patient's response to treatment.

Standard care

A number of patients present with disorders that can be diagnosed and treated using a series of relatively proven clinical practices. A definitive diagnosis is made, and appropriate treatment is started. Some can readily be treated as part of primary care (e.g., many types of infections). Others require referral and are treated in a hospital or medical center setting (e.g., hip and knee replacement, angioplasty procedures, cataract surgery, etc.).

Network care

A proportion of patients acquire a chronic illness, such as diabetes, COPD, or heart failure. Preventing further deterioration of the patient's health becomes the central treatment goal. Chronic disease management includes networking with patients, family, and diverse disciplines of professional care providers. Other aspects include extensive education and a proactive detection of and response to emerging problems. The long-term well being of the patient relies heavily on behavior modification (diet, exercise, drug compliance, etc.).

Primary prevention

A proportion of the patient population as a whole is relatively healthy. The focus of medicine in the care of these patients lies with ongoing wellness examinations and disease prevention. There is a strong reliance on modifying patient behavior for successful prevention. This includes aspects such as the patient's weight, cholesterol level, smoking status, etc.

*Adapted from Bohmer [21].

COPD, Chronic obstructive pulmonary disease.

Table 2: International Healthcare Societies Serving as Gatekeepers That Invite Members to Participate in this Study's Survey

	Australia and New Zealand	Canada	Europe	United States of America
Medicine	• Australian Cardiovascular Health and Rehabilitation Association • Australian and New Zealand Intensive Care Society • Australian and New Zealand Society for Geriatric Medicine • Australian and New Zealand Society for Palliative Medicine • Clinical Oncological Society of Australia • Thoracic Society of Australia and New Zealand • Transplantation Society of Australia and New Zealand	• Alberta Medical Association • Canadian Anesthesiologists' Society • Canadian Association of General Surgeons • Canadian Association of Thoracic Surgeons • Canadian Dermatology Association • Society of Gynecologic Oncologists of Canada	• European Academy of Allergy and Clinical Immunology • European Association of Neurosurgical Societies • European Association of Senior Hospital Physicians • European Association of Urology • European Federation of National Associations of Orthopaedics and Traumatology • European Federation of Neurological Societies • European Forum for Primary Care • European Medical Association • European Neurology Society • European Paediatric Neurology Society • European Respiratory Society • European Society for Emergency Medicine • European Society for Paediatric Gastroenterology, Hepatology and Nutrition • European Society for Radiology • European Society for Therapeutic Radiology and Oncology • European Society for Vascular Surgery • European Society of Anaesthesiology • European Society of Cardiology • European Society of Thoracic Surgeons • Primary Care Diabetes Europe • Vasco da Gama Movement	• American Academy of Otolaryngology- Head and Neck Surgery • American Academy of Pediatrics • American College of Preventive Medicine • Association of Emergency Physicians
Health Policy and Management	• Australasian College of Health Service Management • Australian Healthcare and Hospital Association • Royal Australasian College of Medical Administrators		• European Association of Hospital Managers • European Health Management Association • European hospital and Healthcare Federation	• Academy Health: Health Care Financing and Organization Initiative • American College of Physician Executives
	• International Health Economics Association • International Society for Quality in Health Care			

Table 3: Definitions of Care Payment Systems Assessed by Respondents

Fee for service A separate fee for each service rendered (intervention, encounter, or patient visit).
Capitation A fixed amount that is periodically awarded per enlisted patient and that is independent of actual service rendered. Risk adjustment for case mix may be applied.
Salary A fixed amount that is periodically awarded per time spent at the office or workplace, that is independent of actual service rendered, and that is independent of the number of enlisted patients.
Episode-based payment A fixed amount awarded per episode of care for a patient. Starting and ending point of an episode are defined by care setting (e.g., hospital stay) or more broadly by the disease episode of a patient across care settings. The amount is awarded independent of actual service rendered. Risk adjustment for case mix may be applied.
Quality of care bonus or adjustment A periodical amount awarded in accordance with the degree to which a predetermined set of structure, process, and/or outcome targets has been reached. This type of payment can include using rewards and/or withholds.
Warranty/never event non-reimbursement The part of remuneration not paid to a provider due to the incidence or high frequency of one or more predefined adverse events. An adverse event is an event that results in unintended harm to the patient (complication, readmission, mortality), by an act of commission or omission rather than by the underlying disease or condition of the patient.
Evidence-informed case rates A fixed amount based on all services recommended by well-accepted clinical guidelines or expert opinions. The amount is awarded independent of actual service rendered. Risk adjustment for case mix may be applied.

Table 4: Characteristics of the 942 Participants in the Study*

Characteristic	Value	Characteristic	Value
Age (yr)	50 ± 11	**Specialty/medical degree (%)[†‡]**	
Seniority (yr)	22 ± 11	Surgical specialty	14
Female sex (%)	33	Outpatient specialty	10
Stakeholder role, based on work content (%)[†]		Unplanned specialty	9
Care provider	71	General practice	8
Policy maker	22	Abdominal surgery	1
Healthcare executive	36	Anesthesia	7
Researcher	29	Cardiology	1
Domains of expertise, self-rated (%)[†]		Cardiac surgery	< 1
Medicine	72	Dermatology	2
Nursing	4	Emergency medicine	2
Allied health	6	Endocrinology	< 1
Policy	15	Gastroenterology	1
Executive management	16	Geriatrics	1
Financial management	7	Gerontology	< 1
Public health	9	Gynecology	1
Quality of care	15	Hematology	< 1
Health economics	11	Hepatology	< 1
Psychology	1	Immunology	1
Social sciences	2	Infectious diseases	1
Human resource management	4	Intensive care	8
Law	4	Internal medicine	8
Ethics	5	Nephrology	1
Insurance	5	Neurology	3
Pharmacy	2	Neurosurgery	< 1
Geographical region (%)		Nuclear medicine	1
Canada	10	Obstetrics	1
Oceania	19	Oncology	2
Eastern Europe	9	Orthopedics	< 1
Western Europe	28	Otolaryngology	9
United States of America	35	Palliative medicine	1
Practice setting (%)[†‡]		Pathology	1
Solo primary care	13	Pediatrics	13
Group primary care	21	Plastic surgery	< 1
Non-teaching hospital	10	Preventive medicine	1
Teaching hospital	37	Proctology	< 1
Care payment systems in use to pay physicians (%)[†]		Pulmonology	10
Salary	67	Radiology	< 1
Fee for service	60	Rehabilitation medicine	1
Episode-based	6	Rheumatology	< 1
Capitation	15	Surgery (general)	2
Quality bonus or adjustment	14	Surgical oncology	1
Evidence-informed case rate	2	Thoracic surgery	4
Never event non-reimbursement/ warranty	1	Transplantation medicine	< 1
		Traumatology	< 1
		Vascular surgery	< 1

*Plus-minus values are means ± SD. Values are rounded to the zero decimal place. Because of rounding, percentages may not total 100%.

[†]Respondents could select more than one response category for these characteristics.

[‡]These characteristics pertain to physicians only.

Table 5: Supportiveness of Payment System Use in Fulfilling Patient Needs by Scenario: General Findings*

	Trial-and-error care		Standard care		Network care		Primary prevention	
	Rating (%)		Rating (%)		Rating (%)		Rating (%)	
	Supportive	Unsupportive	Supportive	Unsupportive	Supportive	Unsupportive	Supportive	Unsupportive
Salary	60.7	39.3	56.8	43.2	67.1	32.9	55.6	44.4
Fee for service	69.8	30.2	75.9	24.1	56.0	44.0	57.0	43.0
Episode-based	37.6	62.4	56.6	43.4	41.5	58.5	31.3	68.7
Capitation	23.6	76.4	24.0	76.0	37.3	62.7	35.3	64.7
Quality bonus or adjustment	51.9	48.1	61.9	38.1	64.8	35.2	68.7	31.3
Warranty	19.2	80.8	20.7	79.3	25.8	74.2	20.1	79.9
Evidence-informed case rate	42.4	57.6	53.0	47.0	55.7	44.3	53.2	46.8

*All preferences showed a statistically significant difference at $p < 0.0001$. 'Supportive' includes a supportive or very supportive rating. 'Unsupportive' includes an unsupportive or very unsupportive rating.

Table 6: Preferences for Care Payment Systems According to Stakeholder Group: Odds Ratios*

Payment System Selection by Care Typology		Physician (N=678)	Policy maker (N=207)	Healthcare Executive (N=339)	Researcher (N=273)
Trial-and-error care	Salary	$0.47^{\dagger}$			
	Fee for service				$0.45^{\S}$
	Episode-based			$0.54^{\ddagger}$	
	Capitation				$2.05^{\ddagger}$
	Quality bonus or adjustment	$0.49^{\ddagger}$		$1.92^{\ddagger}$	
	Warranty	$0.31^{\S}$			
	Evidence-informed case rate				
Standard care	Salary				$1.87^{\ddagger}$
	Fee for service	$1.89^{\dagger}$	$0.44^{\S}$		
	Episode-based	$0.51^{\dagger}$			
	Capitation	$0.42^{\ddagger}$			
	Quality bonus or adjustment	$0.53^{\dagger}$			
	Warranty	$0.31^{\S}$			
	Evidence-informed case rate	$0.37^{\S}$			
Network care	Salary				
	Fee for service				$0.54^{\ddagger}$
	Episode-based	$0.41^{\ddagger}$			$0.52^{\dagger}$
	Capitation	$0.51^{\dagger}$	$2.08^{\dagger}$		
	Quality bonus or adjustment				
	Warranty	$0.26^{\S}$			
	Evidence-informed case rate	$0.45^{\ddagger}$			
Primary prevention	Salary				$1.71^{\ddagger}$
	Fee for service	$1.85^{\ddagger}$	$0.54^{\dagger}$		$0.54^{\ddagger}$
	Episode based				
	Capitation		$1.89^{\ddagger}$		
	Quality bonus or adjustment	$0.57^{\dagger}$			
	Warranty	$0.27^{\S}$			
	Evidence-informed case rate	$0.50^{\ddagger}$		$1.89^{\ddagger}$	

*N does not total 942 because respondents can be members of multiple stakeholder groups simultaneously. Non-significant results at the $p < 0.05$ level are represented by empty cells; $^{\dagger}p < 0.05$, $^{\ddagger}p < 0.01$, $^{\S}p < 0.001$. Odds ratios represent the odds that the payment system is preferred by a stakeholder group compared with the odds among the other stakeholder groups, controlled for gender, age, seniority, geographical region, domains of expertise, payment systems in use, specialty/medical degree, and care setting.

Table 7: Preferences for Care Payment Systems According to Geographical Area: Odds Ratios*

Payment System Selection by Care Typology		Canada (N=93)	Oceania (N=177)	Eastern Europe (N=82)	Western Europe (N=261)	United States (N=329)
Trial-and-error care	Salary			$0.22^{\S}$		
	Fee for service					
	Episode-based			$3.73^{\S}$		
	Capitation			$3.53^{\S}$	$2.48^{\S}$	
	Quality bonus or adjustment			$9.43^{\S}$	$2.27^{\S}$	
	Warranty			$5.46^{\S}$		
	Evidence-informed case rate					
Standard care	Salary		$2.10^{\dagger}$	$0.30^{\S}$		
	Fee for service				$0.39^{\S}$	
	Episode-based			$2.68^{\dagger}$		
	Capitation			$2.60^{\ddagger}$		
	Quality bonus or adjustment			$2.16^{\dagger}$		$1.77^{\dagger}$
	Warranty			$2.85^{\dagger}$		
	Evidence-informed case rate					
Network care	Salary			$0.32^{\ddagger}$		
	Fee for service					
	Episode-based			$2.12^{\dagger}$		
	Capitation					$0.44^{\S}$
	Quality bonus or adjustment					
	Warranty			$2.73^{\dagger}$		
	Evidence-informed case rate					
Primary prevention	Salary			$0.20^{\S}$		
	Fee for service			$2.22^{\dagger}$		
	Episode-based			$2.95^{\S}$		
	Capitation					
	Quality bonus or adjustment					
	Warranty			$3.02^{\ddagger}$		
	Evidence-informed case rate			$2.02^{\dagger}$		

*Non-significant results at the $p < 0.05$ level are represented by empty cells; $^{\dagger}p < 0.05$, $^{\ddagger}p < 0.01$, $^{\S}p < 0.001$. Odds ratios represent the odds that the payment system is preferred by stakeholders in a geographical area compared with the odds among the stakeholders in other geographical areas, controlled for gender, age, seniority, stakeholder group, domains of expertise, payment systems in use, specialty/medical degree, and care setting.