



PAPER No. 38

THE VALUE OF CLAIMS ANALYSIS IN HEALTH MICROINSURANCE

LEARNING FROM THREE SOUTH ASIAN
CASES

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Jeanna Holtz, Tobias Hoffarth and Sapna Desai

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EXECUTIVE SUMMARY

Most providers of health microinsurance (HMI) can do more to understand the illness and claims patterns of insured clients. The objective of this study is to demonstrate that analysing claims data equips HMI practitioners with valuable insights to improve the client value and viability of HMI programmes. The study performs a comparative analysis of three South Asian HMI programmes – run by VimoSEWA, Uplift Mutuals and Naya Jeevan. These providers share a common geographic region and offer broadly similar insurance for hospitalization services to low-income households.

Overall findings illustrate that a relatively small number of common illnesses, such as diarrhoea or fever/malaria, along with trauma and accidents, generate approximately 50 per cent of claims costs, a pattern that invites closer, focused monitoring and deeper analysis. These conditions may be amenable to outpatient treatment if detected early and if services are available. Analysis of the causes of claims, and measures which are demonstrated to improve client health and potentially reduce claims, should take account of both the health system context and the treatment-seeking behaviour (including potential occurrences of moral hazard, fraud and adverse selection) of insured clients. The nature and severity of trauma events, and the potential of HMI providers to cost-effectively reduce claims resulting from trauma, deserves further analysis.

It is essential to know why, how often and at what cost clients receive treatment and incur claims. The study provides ten basic recommendations to enable HMI practitioners to unlock the potential of claims analysis. Types of questions that claims data can answer include:

- Which clients incur claims, and for which illnesses?
- Where is care being delivered?
- What is the average cost and time spent in hospital for common illnesses?
- How are the number and average cost of claims changing over time?

HMI providers are encouraged to establish a relevant set of key indicators and to apply a systematic method to collect the data required and to monitor performance. There is no quick fix to address the numerous limitations present in most developing-country settings on collecting desired data. HMI providers should begin by training staff to systematically collect, consolidate and analyse claims data, using unique identifying codes and data management principles to facilitate analysis.

A better understanding of the drivers of claims, including the cause of the claim (diagnosis), can enable HMI providers to identify areas for product and process improvements, leading to improved client value and provider viability. Examples of such interventions include tweaking exclusions, cost-sharing and benefits; introducing value-added services designed to encourage clients to seek outpatient treatment that leads to earlier detection and treatment of illness; training staff and streamlining processes; reconfiguring health-care provider networks or payment mechanisms; and educating clients. Better understanding of claims data also provides insight into how clients and health-care providers respond in the presence of health insurance, and where to focus resources to strengthen health systems.

1. INTRODUCTION

Claims are the moment of truth for insurance (Rendek et al., 2014). Claims make insurance tangible and deliver client value because they can reduce out-of-pocket expenses and decrease reliance on burdensome financing strategies such as the sale of productive assets (Dalal et al., 2014). Equally, claims have a direct impact on the viability of health microinsurance (HMI) programmes. The cumulative costs of claims must be covered by premiums, reserves and capital, and/or subsidies; when they exceed expected levels over time, they challenge the viability of an HMI provider¹.

Gathering and analysing claims data can enable HMI providers to improve client value and business viability by providing insight into the health status of clients and the way they use health services (their treatment-seeking behaviour). An HMI provider can use such information to design and implement measures to improve access to health systems and to encourage more efficient use of services. It also helps HMI providers optimize benefit packages to cover clients' medical expenses, yet remain within sustainable operating limits. Similarly, understanding claims patterns can help identify ways to improve the consistency, quality and cost of health-care services, and to reduce fraud. Moreover, analysing claims data over time helps insurers understand their target market better and supports them to price risks adequately and manage potential adverse selection and moral hazard by clients and health-care providers.

At present, most HMI providers could do more to understand illness and claims patterns. Judging by the experience of the ILO's Impact Insurance Facility, it is common to observe that analysis of claims, particularly of underlying illness patterns, remains limited.² This study builds upon the approach of a previous study of hospitalization claims at VimoSEWA, an Indian microinsurance provider that offers HMI (Desai, 2009).

In this analysis, geared towards practitioners, we focus on three HMI schemes in South Asia to (1) describe and compare claims patterns and reasons for hospitalization, and (2) demonstrate how analysing claims can enhance client value and improve the performance of HMI providers. On the basis of the patterns that emerge, we discuss how claims data can inform HMI providers of: possible actions to balance client value with provider viability; ways in which health systems could be strengthened; and areas to focus on when managing health-care providers. The paper also recommends methods for practitioners to conduct, and maximize the potential of, claims analysis.

This paper is organized as follows: section 2 describes the methodology applied; section 3 introduces the three HMI providers; section 4 presents the results and discussion; and the final two sections contain recommendations and conclusions.

¹ For purposes of this paper, providers of HMI are defined broadly to include insurance companies and other financial risk-bearing entities as well as organizations which distribute HMI to clients but do not bear financial risk. Examples of organizations that distribute HMI include community-based organizations, microfinance institutions, cooperatives and trade associations.

² During the 6-year period between 2008 and 2013, the Impact Insurance Facility (formerly the Microinsurance Innovation Facility) worked with 20 partners who shared data and processes associated with claims and other aspects of their HMI schemes, including product development, pricing, sales and performance monitoring. While some schemes were observed to monitor and measure illness and claims patterns systematically, none were considered to use such findings fully to improve products and operations.

Key health insurance terms used in this paper are explained in the glossary below (Box 1).

BOX 1. GLOSSARY OF HEALTH-CARE AND INSURANCE TERMS

Adverse selection: The tendency for higher-risk individuals (expected to incur high health-care costs) to be more likely to enrol in insurance

Claims frequency: For a sample of insured persons for a particular period, the number of claims or claimants divided by the number of insured persons. This is a statistic often used by actuaries as an estimate for the true underlying probability that an insured from the sample will make a claim (Wipf and Garand, 2010).

Claim rejection rate: For a given period or for an unbiased sample, the claim rejection rate is the proportion of claims that has been disqualified for benefit payment, for whatever reason. The claim rejection rate is calculated with the following formula: claim rejection rate = number of claims rejected / number of claims in the sample (Wipf and Garand, 2010).

Communicable diseases: These are also called infectious diseases. They are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi. The disease can be spread, directly or indirectly, from one person to another (WHO, 2014).

Incurred claims ratio: This is defined as the incurred claims in a given period divided by the earned premium for the same period. The period can be a fiscal year or any other accounting period. The incurred claims ratio is calculated with the following formula: Incurred claims ratio_n = incurred claims_n / earned premium_n (Wipf and Garand, 2010).

Length of stay (LOS): This is the number of nights which a patient spends in the hospital. The LOS amounts to 1 when the date of admission and discharge are the same.

Moral hazard: Behavioural changes that occur when people are insured against losses, including a disregard for managing health risks or increased use of health services when covered by health insurance.

Non-communicable diseases (NCDs): NCDs are not passed from person to person. They are of long duration and generally slow progression, and hence often known as chronic diseases (WHO, 2014).

Trauma: This refers to harm to an individual usually due to an accident or injury, including fractures, cuts, burns and electric shock. This study limits trauma cases to those that are physical in nature, rather than psychological.

2. METHODOLOGY

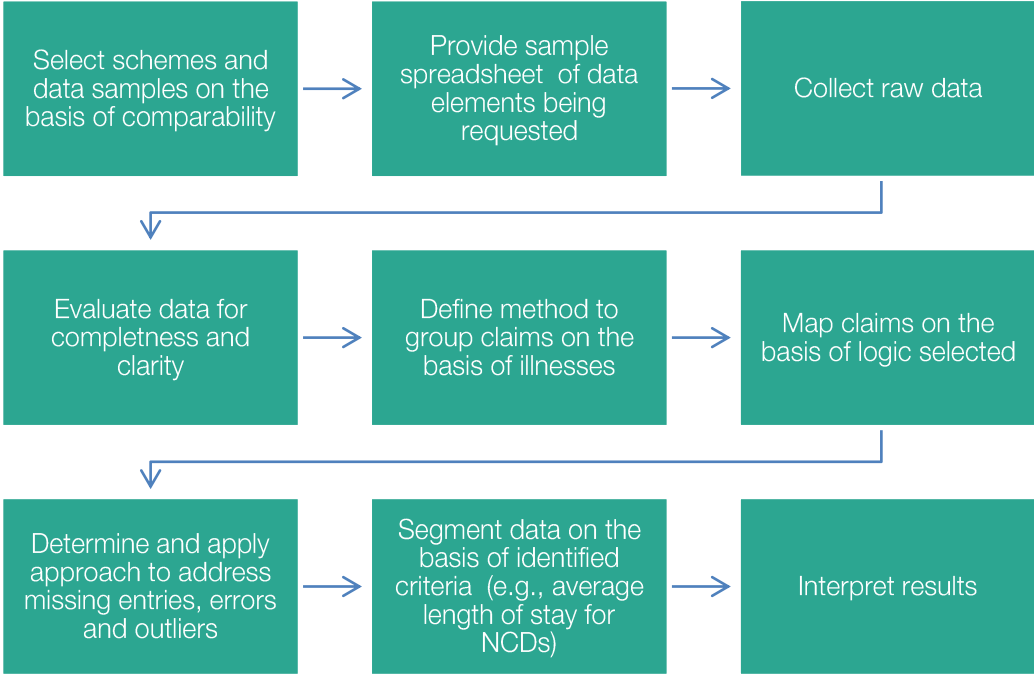
This study compares three South Asian HMI providers: VimoSEWA and Uplift Mutuals, both in India, and Naya Jeevan in Pakistan. The three providers were purposively selected on the basis of three criteria: each provider (1) routinely collects claims data that include illness information, (2) is a Facility partner with an interest in participating in the study and (3) offers an HMI product that covers hospitalization.

A sub-set of each provider's claims data was analysed for either a 2- or a 3-year period. Given variation in HMI structure and data management systems, a common set of data elements was defined and collected for this study. Each provider shared claims data, comprising either all data that were available or

a sample (from a specific region or product) that was complete and amenable to analysis, as well as enrolment data. As data varied across providers, the analyses conducted were meant to be illustrative rather than comprehensive.

The process followed to collect and analyse the data is illustrated in Figure 1.

Figure 1. Process flow to gather and analyse claims data



Data elements requested included enrolment and claims data by year, which included age of claimant, gender of claimant, date of admission and date of discharge. The providers were also asked to submit key performance indicators such as claims ratio, renewal ratio and claim rejection rates. The three providers submitted claims data in existing formats for convenience, after which each data set was cleaned using consistent criteria by a data analyst.

The claims data from each provider were then grouped into general illness categories to improve comparability across the providers (Box 2). Claims frequency – the proportion of members who submitted a claim in a specific period – was calculated using data for enrolled members and claimants per year, and then these figures were expressed as a single proportion for the period studied. Thus we present the likelihood (frequency or probability) of a client submitting a claim during a given period.

Ideally, claims rates would have been calculated using the exact number of days of coverage per member as the denominator (person-time insured) and the exact number of claims incurred by those members during that period as the numerator, but these data were not available for all three schemes. The purpose of this analysis was to demonstrate why and how claims analysis is critical to the management and sustainability of an HMI provider, by illustrating an example across three providers. In an in-depth analysis of one scheme, claims rates by product, gender, age, location, type of facility and other demographic and service-use variables would also be essential statistics for management review. Average cost per claim was calculated using consistent data across schemes, namely the amount paid rather than amount claimed. Again, in an in-depth analysis, data on all expenses incurred would be important to evaluate a scheme’s effectiveness.

BOX 2. CLUSTERING ILLNESS CATEGORIES

A list of broad illness categories was developed for the purpose of grouping claims to enable understanding of the illness patterns of clients, as described below. Such an approach is only as accurate as the underlying reporting of diagnoses, and involved judgement to interpret some diagnosis descriptions.

Diarrhoeal illnesses: diarrhoea, vomiting, food poisoning, dysentery and amoebic colitis.

Gastrointestinal conditions: acid peptic disease, stomach ache, abdominal pain, appendicitis, constipation, gastritis, and other identified conditions of the intestine, stomach, gall bladder, liver, oesophagus, pancreas or rectum.

Non-communicable diseases: blood pressure, cancer, cardiovascular problems, diabetes and metabolic disorders.

Trauma: accidents, injuries, bites, burns, bleeding, electric shocks and related musculoskeletal conditions.

Diagnoses concerning common ailments such as fever, malaria, hepatitis, measles, mumps and tuberculosis were grouped separately under categories corresponding to each diagnosis. As far as possible, the remaining claims were grouped by matching the diagnosis reported to the organ or body system concerned: sensory (ear, eye, nose), nervous, reproductive, respiratory or urinary system.

A smaller number of claims could not be grouped into any of the above categories and included diagnoses such as anaemia, headache, hernia or pain. These diagnoses were classified in separate categories; only a minority of claims could not be related to one of the categories designated above.

The data were checked for accuracy, completeness and format by two analysts in coordination with each HMI provider. Numerous gaps were noted and are detailed in section 4. Claims data were stored in secure and confidential locations. Personal identifiers, such as names and addresses, were removed from the data elements. Only the authors had access to the data.

3. VIMOSEWA, UPLIFT MUTUALS AND NAYA JEEVAN

Table 1 describes characteristics of the three HMI providers featured in the study. Each provider offers inpatient hospitalization coverage, albeit with varying benefit levels. The providers vary significantly in their membership, operate different business models, charge different premiums, offer different benefits and structure enrolment of groups or individuals differently (voluntary or mandatory). Although illness and claims patterns certainly differ across and within countries, a relatively common pattern of morbidity and treatment-seeking behaviour and access to health care was assumed as all three providers are based in South Asia and serve low-income populations.

Table 1. Description of the HMI schemes

	VimoSEWA	Uplift Mutuals	Naya Jeevan
Country	India	India	Pakistan
Operates since	1992	2003	2009
Target market	Urban and rural; informal women workers and their families	Urban and rural; microfinance clients and their families	Urban; mostly male employees of small enterprises, contract workers or domestic staff; may include family
Membership	100 000 (2011)	149 198 (2012)	23 500 (2013)
Business model	Partner-agent	Community-based mutual	Partner-agent
Enrolment	Voluntary	Mandatory (mostly)	Voluntary
Premium	INR ³ 400 (US\$6–7) per family	INR 400 (US\$6–7) per family	PKR ⁴ 1 800-3 000 (US\$18–30) per person
Maximum benefits for hospitalizations	INR 5 000 (US\$32)	INR 2 500–15 000 (US\$42–250)	PKR 150 000 (US\$1 500)
Exclusions, limits	Non-communicable disease for 1 year	Pre-existing conditions 1-month waiting period INR 150 000 (US\$250) maximum sum assured per year 80% at private network hospitals ³⁵	Pre-existing conditions only waived for groups greater than 200 Maternity: rider
Value-added services	No	Various	Various
Cashless	Yes	No	Yes
Incurred claims ratio (%)	103–105	79 ⁶	59–94 (small sample)
Renewal ratio (%)	59–66	74	> 80

Table 2. Overview of the datasets

	VimoSEWA	Uplift Mutuals	Naya Jeevan
Number of years observed	2	3	3
Years for which data were provided	2010, 2011	2008, 2009, 2010	2011, 2012, 2013
Total members over period of time observed ⁷	177 732	47 237	13 048
Total claims over period of time observed	6 323	1 044	397

³ Indian rupees;

⁴ Pakistani rupees.

⁵ Compared with 100% at public facilities

⁶ Another feature of the Uplift Mutuals model is that community-led claims committees are empowered to reduce or even eliminate the benefit payable under the benefit package. Claims committees may elect to reduce a claim payment on the basis of the funds available for claims, and client-specific factors such as claims history and financial need may also influence the final claim payment awarded. This greater discretion over claims settlements gives more options to control and manage claims cost as the risk is borne by the Uplift Mutuals' community members and not by Uplift Mutuals. To the extent that the claims payouts are reduced, the claims ratio reported by Uplift Mutuals is lower than it would be if all allowable benefits were approved. This difference in claims adjudication also means that Uplift Mutuals's claims ratio is less directly comparable with those of VimoSEWA and Naya Jeevan, since these two schemes rely on their insurance partners, who have accepted financial risk for the claim, to pay benefits consistently according to the applicable policy terms and conditions.

⁷ The number of members and claims submitted was calculated annually and then combined. Hence a unique member may be counted more than once in the total for the period of time observed, in order to calculate the overall probability of claims submission.

4. FINDINGS AND DISCUSSION

The analysis of data and indicators, such as claimant demographics, diagnosis, cost per claim, average length of stay, claims frequency and claim rejection rate (and reason for rejection), enables practitioners to gain valuable insights into illness and claims patterns. Summary statistics concerning the claims data analysed for the three HMI providers is provided below (Table 3).

Table 3. Key claims statistics for three HMI schemes

Indicator	VimoSEWA	Uplift Mutuals	Naya Jeevan
Average age of claimant (years)	33	36	29
Average annual claims frequency	36	22	30
Average cost of claim (US\$)	40	41	187
Average length of stay (days)	3.5	4.9	3.7
Rejection rate (%)	13.5	3.8	7.0

4.1. A HANDFUL OF HEALTH EVENTS GENERATE MOST CLAIMS

Overall findings illustrate that a relatively small number of common illnesses, such as diarrhoea or fever, along with trauma and accidents, give rise to the majority of claims. The most frequent diagnosis categories reported on claims for each provider are illustrated in Table 4.

Table 4. Top ten causes of claims as a percentage of total claims costs

	VimoSEWA	%	Uplift Mutuals	%	Naya Jeevan	%
1	Fever	19.7	Trauma	21.0	Trauma	22.1
2	Gastrointestinal	11.8	Non-communicable disease	16.9	Gastrointestinal	14.1
3	Diarrhoeal	9.8	Fever	14.2	Non-communicable disease	11.3
4	Non-communicable disease	9.7	Reproductive health	13.3	Fever	8.2
5	Trauma	9.0	Gastrointestinal	7.4	Respiratory	6.6
6	Respiratory	7.8	Diarrhoeal	5.4	Reproductive health	6.1
7	Malaria	6.3	Respiratory	5.3	Urinary	4.1
8	Eye	6.3	Urinary	3.5	Hernia	3.6
9	Urinary	5.1	Nervous	2.1	Diarrhoeal	3.2
10	Reproductive health	4.8	Malaria	1.9	Eye	2.6

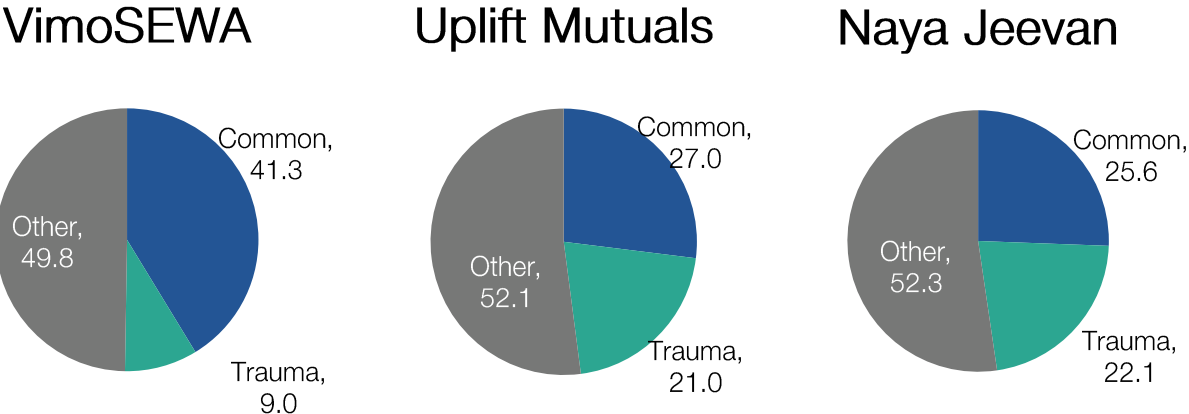
Between 40 and 50 per cent of total claims costs for each provider were generated by three diagnoses or causes. Fever (20 per cent), gastrointestinal conditions (12 per cent) and diarrhoeal illness (10 per cent) constituted 42 per cent of VimoSEWA's total claims costs. Similarly, trauma (21 per cent), fever (14 per cent) and reproductive health (13 per cent) made up nearly 50 per cent of Uplift Mutuals's total claims costs. Naya Jeevan's claims costs are significantly influenced by trauma (22 per cent), gastrointestinal conditions (14 per cent) and fever (8 per cent), which account for 44 per cent of total claims costs. An in-depth analysis of claims costs would include average cost per claim, proportion of total claims costs and disaggregation by gender, location and other variables.

4.2. COMMON ILLNESSES AND TRAUMA GENERATE APPROXIMATELY 50 PER CENT OF CLAIMS COSTS

The analysis suggests that measures which are demonstrated to improve client health as far as common illnesses and accidents are concerned have the potential to reduce claims. Illnesses such as water-borne/diarrhoeal illness, fever/malaria, some respiratory conditions, and tuberculosis may be amenable to outpatient treatment if detected early and if services are available. In addition, many accidents and injuries are also possible to mitigate or prevent, through precautions and improved infrastructure. We have used the category “common” illness to denote illnesses that are typically considered preventable or amenable to outpatient treatment, to facilitate comparison across schemes. Specific categories would be more appropriate for a single-scheme analysis.

These claims constitute 50 per cent, 48 per cent and 48 per cent of total claim costs for VimoSEWA, Uplift Mutuals and Naya Jeevan, respectively (Figure 2). These statistics should be viewed as illustrative and are included in this study to demonstrate how claims analysis can highlight which causes of claims have the greatest potential effect on the viability of HMI providers as well as the health status of insured clients. While a proportion of common illnesses may be preventable through public health interventions or treatable in outpatient facilities, analysis should consider both the health system context and the treatment-seeking behaviour (including potential moral hazard or adverse selection) of insured clients. The nature and severity of trauma events, and the potential of HMI providers to cost-effectively reduce claims resulting from trauma, deserves further analysis. Although typically less emphasized in public health activities, trauma resulting from burns, cuts, fractures and motor vehicle accidents may be possible to influence with interventions that could result in a positive cost-benefit ratio for HMI providers, if not immediately, then over the mid- to long term.

Figure 2. Claims analysis by category



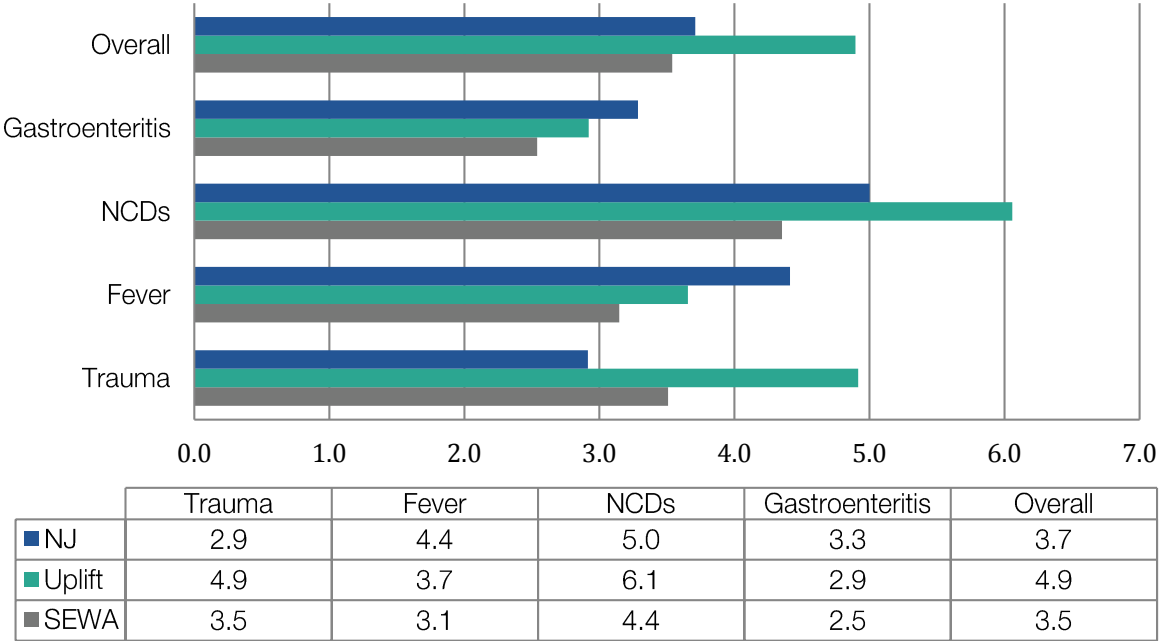
Note: The term “common” refers to conditions that are typically preventable or amenable to outpatient treatment. It includes fever, malaria, tuberculosis, measles, hepatitis, trauma, diarrhoeal illness and respiratory conditions. While hospital stays for other conditions, including non-communicable diseases such as diabetes, also have scope to be reduced, most likely over a longer time horizon, they are not included in this category for illustrative purposes.

4.3. AVERAGE LENGTH OF STAY IN HOSPITAL IS HIGHER FOR NON-COMMUNICABLE DISEASES

Average length of stay is a key determinant of the cost of claims. Thus it can be useful to analyse this indicator by illness, age, gender, morbidity, health-care provider or other parameters. The average length of stay across the three schemes was 3.5, 4.9 and 3.7 days for VimoSEWA, Uplift Mutuals and Naya Jeevan, respectively (Table 3). The average length of stay for diarrhoeal illness, non-communicable

diseases, fever and trauma for each HMI scheme is illustrated in Figure 3. As above, in-depth analysis of a particular scheme would benefit from analysis across demographic variables.

Figure 3. Average length of stay for selected illnesses and trauma (days)



As expected, the claims experience of the three schemes showed a higher average length of stay for non-communicable diseases compared with that for claims concerning fever, diarrhoeal illness or trauma. Claims incurred for non-communicable diseases reflect the incidence of chronic diseases, which tend to require longer hospitalization. The concurrent presence of significant levels of communicable diseases, such as malaria, and non-communicable diseases, such as cardiovascular disease and diabetes, (described as the “double disease burden”) suggests that, as the incidence of non-communicable diseases increases, so, too, could overall average length of stay, leading to higher claims costs.

The average length of stay by cause of claim varied across the three schemes. Interestingly, Uplift Mutuals, with the highest overall average length of stay, experienced a higher average length of stay for claims associated with non-communicable diseases and for trauma, yet, as noted below, had a lower frequency of claims. More analysis of distribution of length of stay, and of the diagnosis pattern, could shed more light on this tendency, as could further monitoring of experience over a longer period of time and with a larger dataset.

4.4. CLAIMS PATTERNS REFLECT THE HEALTH SYSTEM AND TREATMENT-SEEKING BEHAVIOUR

Claims patterns can provide insight into underlying patterns of illness and the treatment-seeking behaviour of insured clients. Analysing claims frequency and rejections by diagnosis or other variables, such as health-care provider or claimant demographics, can identify ways to align HMI products, services and operations with the needs and objectives of both clients and HMI providers, as well as to assess how clients use products.

Hospitalization claims also reflect the status of health services accessible to clients. For example, if outpatient services are weak, hospitalization for fever and diarrhoea may be more common. Clients may delay seeking treatment until their illness becomes so advanced that a hospital stay is required, or they may receive inadequate primary care, which exacerbates the severity of the illness, or they could be unable to access primary care at all. For example, on the basis of patterns that emerged from a claims analysis and survey in 2010, VimoSEWA conducted an in-depth qualitative study that identified health

system factors, in particular poor-quality outpatient care, as the primary reason hospitalization insurance was used for seemingly preventable illnesses or those that were treatable in outpatient facilities (Sinha et al., 2014). The study also indicated that provider moral hazard could not be ruled out in explaining hospitalization patterns. Another VimoSEWA analysis comparing insured and uninsured women found that hospitalization patterns reflected a lack of effective preventive and primary health care, and differences across insurance status also suggested the possibility of adverse selection and moral hazard (Desai et al., 2014).

In addition to treatment-seeking patterns, claims frequency is also influenced by the demographics of clients, including their age and gender, the length of time they have been enrolled, and their understanding of their benefits and how to claim. The scope of services covered by the scheme and the associated out-of-pocket costs borne by clients influence the frequency of claims. Moral hazard, fraud and claims adjudication controls add to the mix of HMI provider contextual and operating variables that influence treatment-seeking patterns and claims (Rendek et al., 2014). In-depth analysis of claims, and additional research (if required), can provide insight into how and why claims are actually incurred – a critical yet often missing enabler of better HMI management.

4.5. LINKING CLAIMS ANALYSIS TO PROVIDER OPERATIONS

As with the findings noted above on average length of stay, VimoSEWA, Uplift Mutuals and Naya Jeevan had different claims frequency and rejection rates for the period examined (Table 3). Uplift Mutuals had the lowest claims frequency (22 per thousand members per year) and lowest rejection rate (3.8 per cent), whereas VimoSEWA recorded the highest claims frequency (36 per thousand members per year) and highest rejection rate (13.5 per cent). Naya Jeevan experienced a claims frequency of 30 per thousand members per year. These patterns reflect a range of differences between the providers: operations, demographics, health services and value-added services, for example, can influence how often clients use services.

In order to make a more precise comparison of claims frequency across schemes and over time, an analysis that adjusts for age, gender, benefits or other variables by claim type would be necessary. For example, calculating the frequency of claims for appendicitis in males aged 20–35 years would generate more comparable findings across schemes for that particular diagnosis. An analysis of claims rejections provides insight into the efficiency of the claims process, client knowledge and barriers from the perspective of both clients and the HMI scheme. The variation in rejection rates across these three schemes likely reflects a combination of different member profiles, claims processes and scheme design. For example, both VimoSEWA and Naya Jeevan operate in a partner–agent model, under which an insurance partner is underwriting the risk and paying claims. In contrast, it is worth noting that Uplift Mutuals is able to leverage its community-based mutual model to promote transparency of claims, including rejections, and accountability of claimants. Both VimoSEWA and Uplift Mutuals’s products have exclusions for pre-existing illnesses, either through a waiting period or for specific conditions, whereas Naya Jeevan’s product is less restrictive in this regard. On the other hand, Uplift Mutuals’s product applies a variety of benefit limits (often referred to as sub-limits) across different illnesses, considerably more than do VimoSEWA or Naya Jeevan’s products. Comparison across schemes is less helpful in understanding rejection rates; individual analysis of schemes with disaggregated rejection data could provide essential information for management processes.

4.6. CHALLENGES WITH CLAIMS DATA LIMIT THE POWER OF ANALYSIS

There is a high degree of inconsistency and ambiguity or inaccuracy in how medical diagnoses are reported in the hospital discharge documents and therefore in the data recorded by the three insurance providers studied here. This creates challenges with aggregating and interpreting claims, and making

comparisons within and across HMI providers. Many claims documents present symptoms (for example, dizziness or weakness) in lieu of a specific diagnosis. Another challenge concerns the variation in terms used to convey a common diagnosis. For example malaria might be reported as fever, acute malaria, malaria, infection, and so on. A wrist fracture might be documented as a radius fracture, broken arm, arm fracture, accident, or other term. Both of these examples reflect health-care provider billing practices in most low-income settings: a challenge for HMI providers is how to record and categorize these available data to best inform HMI management of claims patterns in these settings.

Further, handwritten bills and claims forms may be illegible and lacking information, and they may not have consistent formats; in some cases data submitted in a local language may not be correctly understood or translated into English, the language being used by the HMI providers, or the data entry operator may not understand medical terminology sufficiently to correctly codify diagnosis and treatment data.

Another source of variation in claims data (though not measured by this study) is the extent to which the desired data are entered fully and correctly by the HMI provider. Each provider reported that its capture of claims data varied by factors such as time, data entry operator, benefit plan, software and spreadsheet design. Naya Jeevan reported variation in the timeliness and content of claims data provided to it by several insurance partners. One of these partnerships had been terminated by the time this study was carried out, a factor which limited Naya Jeevan's access to claims data for members covered by this former insurance partner.

In addition to the limitations noted above, the variation in the schemes offered by each provider – particularly the membership profile, operating structure and data available – prevented comparisons of claims rates according to demographic variables such as gender, socio-economic status and age. We have presented the proportion of claims submitted over a particular time period, but a more accurate comparison would have used claims rates based on exact membership and claims periods, which were not available. As the objective of this analysis was to illustrate how claims analysis can strengthen HMI management, client value and provider viability, we did not conduct analyses that could provide insight into any single provider over time or in light of its operational mechanisms.

Despite these limitations, using data from three providers allowed us to identify cross-cutting recommendations on claims data analysis that should resonate with many HMI providers – and demonstrate that not only is claims analysis critical, it is also possible in a variety of settings (section 5).

5. RECOMMENDATIONS FOR PRACTITIONERS

The ten basic recommendations set out in this section enable practitioners to unlock the potential of claims data analysis in order to improve client value and provider viability.

5.1. DATA COLLECTION AND MANAGEMENT

1. Define, assign and communicate responsibilities for gathering, monitoring and interpreting claims data: Multiple actors are involved in gathering, monitoring and interpreting claims data, including health-care providers, insurers and sometimes distribution channels and third-party administrators. HMI providers need to define, implement and communicate relevant operating procedures to provider staff and external partners (focusing on health-care providers) to ensure that information on clients and claims data is collected, stored and analysed.

2. Identify key data elements and a process for data collection and analysis: HMI providers grapple with limited and often poor-quality data. An HMI provider must establish a data analysis plan first, in order to identify the key data elements, and then develop a process to collect and analyse these data, guided by availability and considering the inherent trade-offs. Data capture (electronic or paper) should include all information required to calculate key performance indicators⁸ and variables such as gender, age, location and occupation. Similarly, dates of admission and discharge are required to calculate length of a hospital stay, and the dates that a complete claim was received and settled are required to calculate the HMI product's internal turnaround time. An illustrative list of common claim data elements is provided in Appendix 1. Enrolment data – over time and linked to claims data – are a key component of claims analysis and should be reviewed for suitability for analysis.

3. Support data consolidation and segmentation with unique identifiers, standard definitions and codes: Unique identification numbers or codes should be assigned to each policy, person insured, health-care provider and claim. Standard descriptions and codes also need to be agreed on and used for diagnosis categories (for example, gastroenteritis = GE), type of health-care provider (for example, private hospital = PH) and claim status (for example, approved = A). In the case of member data, it is important to apply a consistent method to identify the relationship of the claimant (for example, spouse or child) to the policyholder. For example, the use of a common suffix linked to the policyholder's unique number can allow claims data to be disaggregated to the individual claimant, as well as consolidated at the policy or household level. With appropriate use of unique identifiers, definitions and codes, claims data can be segmented for reporting purposes in countless ways (for example, to review claims from private hospitals for hysterectomies during the 3-year period ending 30 June 2014) to support HMI provider management needs.

4. Use software: Software facilitates data storage, back-up, monitoring and sharing and need not be expensive or complex. For example, HMI providers have successfully used Excel spreadsheet software in addition to customized software to analyse their claims data. Claims management software can improve the consistency and quality of data, in particular when it uses menus rather than open fields and when it runs a check to avoid erroneous data entry. Software should also have the capacity to capture historical data, either through capture of a non-transactional database or through separate, linked databases.

5. Carry out training and monitoring activities: Training is essential to ensure that health-care providers, internal staff and other stakeholders know how to collect and submit claims data to the HMI provider. Monitoring the accuracy of claims data capture helps check the effectiveness of existing procedures and identify areas for improvement.

5.2. DATA ANALYSIS

6. Identify the key drivers and claims patterns over time: Following a well-developed approach to data collection and management, providers should allow claims utilization patterns to emerge clearly, with enough data to identify who and what are driving claims. Analysis over time will help ensure that trends such as medical cost inflation are captured, which can impact both HMI product design and client value.

⁸ Practitioners who seek more information about microinsurance performance indicators are encouraged to read Sandmark et al., 2013 and Wipf and Garand, 2010.

7. Monitor turnaround time and rejection rates from client's perspective: Although this study did not include analysis of turnaround times,⁹ it is worth noting that claim turnaround time is a key indicator of client value, as are claim rejection rates. Lengthy turnaround time and high rejection rates also point to bottlenecks and poor processes, which can erode value and add both direct costs (additional staff time to process) and indirect costs (lower client retention) to an HMI product.

8. Identify variation in treatment, service use and charges among clients and health-care providers: HMI is often associated with lower out-of-pocket expenditure, which can reduce financial barriers for clients and enable them to use health-care services more frequently. HMI providers need to monitor trends in use – by client segment, by illness, by health-care provider, and so on – in order to highlight variation in treatment, service use and costs, which can help identify fraud, moral hazard or outliers where intervention may be warranted. For example, health-care providers may exhibit moral hazard by charging higher fees for treatment provided to insured patients, or a client may share an insurance card with extended family members who are not enrolled in the HMI scheme.

9. Use claims data to optimize product design and calculate more accurate premiums: Analysing claims data can guide practitioners to improve products and ultimately deliver client value and achieve viability (Box 3). Moreover, in developing countries many insurers engage in trial-and-error approaches when pricing health risks, and lack sufficient understanding of claims experience. In one example, Microcare in Uganda discovered that premiums in force were under-priced too late to allow timely intervention, a factor that contributed to the eventual termination of the scheme (Greyling, 2013). When insurers know more about illness and claims patterns, they are in a better position to price risks. However, VimoSEWA's experience indicates that claims data alone are not sufficient for pricing products, but can serve as one element of an evaluation that also covers the membership profile, enrolment patterns and treatment-seeking behaviour in the population (Oza et al., 2013).

BOX 3. UPLIFT MUTUALS: AN EXAMPLE OF USING CLAIMS MONITORING TO PROMOTE CLIENT VALUE AND SCHEME VIABILITY.

After it observed that frequent use of expensive non-contracted private facilities was driving claims costs, Uplift Mutuals expanded availability of its help-line service to 24/7 coverage. Clients were encouraged to contact the help-line for guidance about where they should seek hospital treatment based on their medical condition, and where they could take advantage of negotiated rates with participating facilities to limit costs. It has also introduced limits on benefits, depending on the type of illness (for example, gastrointestinal or orthopaedic), in order to optimize client value within a defined budget.

10. Analyse and disseminate data with a view to improving the health system: Practitioners should focus on the key drivers of claims, while disseminating data beyond the insurance provider. For example, if a substantial proportion of claims are for malaria, the data can be used to advocate for improved prevention measures, such as bed nets and spraying – which ultimately may improve both client health and HMI efficiency. Other interventions, such as improving access to primary care, possibly through health workers or dial-a-doctor call centres organized by the HMI provider, or via linkage to health system

⁹ The time between the submission of a claim and the payment of a claim is described as claim turnaround time. It is a crucial aspect of client value, in particular when low-income clients pay for health-care services upfront and later receive reimbursement from the insurer. Time is measured from the date that the covered event happens to the date that benefit(s) were received by or denied to the client(s) (Wipf and Garand, 2010).

programmes, might be appropriate. Yet whether and under what circumstances preventive interventions may indeed promote value for clients (including better health), and also be viable, is an area for further research (Holtz et al., 2014).

Overall, it is essential to know – and share – why, how often and at what cost people are hospitalized (or receive outpatient services). Claims analysis may also lead to future research, as in the case of VimoSEWA, which conducted research to compare hospitalization claims by insured women with patterns of hospital stays by uninsured women and investigated the potential of preventive health interventions to reduce claims for preventable illness (Desai et al., 2014).

6. CONCLUSION

The body of literature on illness and claims patterns in HMI schemes is limited. Through an illustrative analysis in three different settings, we aimed to demonstrate why and how claims analysis is crucial for HMI viability and client value. Careful monitoring of why clients use benefits can point to areas for intervention, such as health education, or mechanisms to reduce adverse selection and moral hazard. In the three schemes studied, a handful of common illnesses or trauma events generated most claims. While suggesting areas in which the scheme could evaluate its own performance, these patterns also point to weaknesses in the health system, and indicate where insurance fills gaps in health services. Claims analysis has the power to improve internal systems as well as identify external factors that drive treatment-seeking patterns: with careful monitoring, both HMI schemes and the clients they serve stand to benefit.

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APPENDIX 1. ILLUSTRATIVE LIST OF CLAIM DATA ELEMENTS

The following information should be provided per claim:

- Unique identifier of claim
- Unique identifier of policy
- Unique identifier of claimant
- Name of claimant
- Date of birth of claimant
- Gender of claimant
- Address of claimant (district, rural/urban, etc.)
- Relation of claimant to policyholder (self, spouse, child, etc.)
- Name of health-care provider
- Address of health-care provider
- Unique identifier of health-care provider
- Type of health-care provider (e.g. private, public, trust/charity)
- Date of admission
- Date of discharge
- Diagnosis (description plus code if applicable)
- Procedure or service(s) provided (description plus code if applicable)
- Billed charges (itemized)
- The following information is supplied by the insurer:
 - Policy period (start and end dates) and status (e.g., in-force, lapsed, etc.)
 - Date of receipt of claim
 - Date of pending action, and reason (e.g., request for additional medical information), if applicable, and date of further submission(s)
 - Date claim is adjudicated
 - Decision on claim settlement (e.g. approved, rejected)
 - Benefits allowed (and any disallowed)
 - Reason for rejection (if applicable)
 - Date of claim payment to client or health-care provider

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