

## Review Article

# Determinants of Hospital Readmission of Medical Conditions in Developing Countries

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Hospital readmission is a high priority health care quality measure and target for cost reduction. Nearly one fifth of Medicare beneficiaries discharged from hospitals are readmitted within 30 days thus incurring additional cost of several billions of dollars annually. The problems associated with readmissions are more pronounced in developing countries due to limited resources to grapple with these effects. Contrary to previous research done which focused on specific medical conditions, this research placed emphasis on general medical conditions.

The paper sought to identify socio demographic and system related factors that predispose individuals to hospital readmissions in developing countries.

Literature was searched from Scopus, Web of science, ProQuest, PubMed and Google Scholar from 1993 to 2015. Articles found eligible examined the relationship between social factors and readmission, and socio demographic factors and readmissions.

45 articles met the inclusion criteria with 80% examining readmission among the elderly (>65 years), 20% examined readmission among young groups (<65 years). 50% examined the relationship between social factors and readmission while 30% examined the impact of system related factors on readmission. 20% evaluated interventions for readmission reduction.

Policies aimed at improving follow up are likely to reduce readmission rate in majority of the determinants. Follow up could be strengthened through the development of a database of contact details of public or community health nurses in catchment area of each district or sub district so that during discharge, the traceable address of patients can be communicated with the health worker either through phone calls or sending of text messages. In addition, introduction of software for discharge can be implemented so that an automatic email including brief history about client, traceable address and the need to follow up within the first – second week post discharge will be sent.

**Keywords:** Readmission; Medical conditions; Socio demographic; Developing countries

## Introduction

Internationally, hospital readmissions have a great appeal as an indicator of hospital quality since possibilities of prevention and control exist [1]. Patients who are discharged from hospital and readmitted within a short time are a considerable cause of concern for healthcare providers [2]. Almost one fifth of Medicare beneficiaries discharged from acute care hospitals are readmitted within 30 days incurring additional cost of several billions of dollars annually [3]. Readmission also increases financial pressure on hospital and on national health budget [4]. That is to say, there will be welfare loss because monetary resources which could have been used to improve infrastructure either in the health facility or to improve other sectors will be used to treat readmitted patients.

Readmission is a significant public health issue because attempts to reduce this issue through the recognition of its determinants will help protect, promote and restore health of population.

Hospital readmission is therefore defined as “an admission of patient to an inpatient service of an acute care hospital who was discharged from an inpatient service of the same or different acute care hospital within 30 days” [5]. Medical conditions will include any physiological, mental or psychological disorders.

It has been established that, the problems related to readmission is much compounded in developing countries due to limited resources and lack of funding to grapple with these alarming increase [6]. Hence the need to explore the determinants of readmission so as to adopt strategies to ameliorate its incidence.

While numerous researches have been conducted in developing countries regarding the issue of interest, previous studies focused on readmissions among specific medical conditions. There is therefore paucity of literature on readmission among general medical conditions in developing countries and hence the knowledge gap with which I sought to explore.

**Table 1:** Summary of search terms.

Keywords	Boolean Operator	Keywords	Boolean Operator	Keywords
Social OR economic OR environment OR education OR employment	AND	Rehospitalization OR readmi* OR "repeated admission" OR rehospitali* OR hospital OR "health facility"	AND	Developing country* OR "low income"

This paper will assess, critically analyse and synthesize literature on the socio demographic and system related factors that lead to readmissions through a narrative review and finally recommendations to help address the issue will be discussed accordingly.

## Methods

Secondary data of research done by other authors was the method employed to derive data. A systematic search was undertaken to identify areas of focus.

An electronic search of public health databases was conducted by reviewing literature in Scopus, Web of science, ProQuest, PubMed and google scholar. The selection of these databases was due to their high quality of literatures from numerous scholarly journals and full text availability [7]. Also hand searching from cited references was done to retrieve additional relevant information.

### Keywords

The strategy of combining Medical Subject Headings (MeSH) and text terms was used to find relevant literature. Some of the keywords include the following: economic, education, socio demographic employment, readmission, rehospitalisation, repeated admission, hospital and developing countries.

Appropriate Booleans operators such as (OR, AND, “\*”) was used to retrieve relevant literature in combination with keywords. The librarian’s invaluable help was sought with regards to choice of keywords and relevant databases (Table 1).

### Inclusion criteria

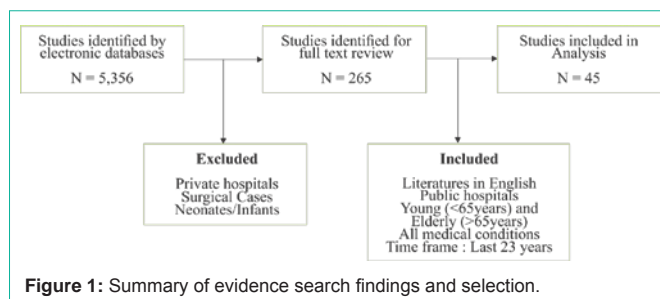
Studies included were as follows: literatures written in English, all studies conducted in a public hospital in any developing country, conducted among categories of age groups of young (<65 years) and elderly (>65 years) in order to get a clear picture of the situation across these age groups and to know the age mostly affected. All studies conducted among patients with medical conditions were also included since research has shown that medical conditions account for increase readmissions and leads to corresponding increase in cost [8]. Search timeframe was from the last twenty three years so as to understand the trend of events across the past years to recent years regarding the topic of interest.

### Exclusion criteria

Studies conducted in private hospitals were excluded because system related factors may differ from public sector hospitals, all surgical cases were excluded in order to get the exact determinants for medical cases. More so, studies conducted among neonates and infants were also excluded because a social factor that may lead to readmission is dependent on their parents who are already in the inclusion criteria age range.

## Search Findings

A review by titles and then abstract was done to assess whether it meets the inclusive and exclusive criteria. Databases reviewed came up



with 5,356 literatures. Application of inclusion and exclusive criteria reduced the whole literature to 265 and relevant ones selected came to 45. Out of the literature retrieved, 80% examined readmission among the elderly (>65 years), 20% examined readmission among young groups (<65 years). 50% examined the relationship between social factors and readmission while 30% examined the impact of system related factors on readmission. 20% evaluated interventions for readmission reduction. Majority (98%) of the literatures examined specific medical conditions with few studies (2%) examining the relationship between readmission and general medical conditions (Figure 1).

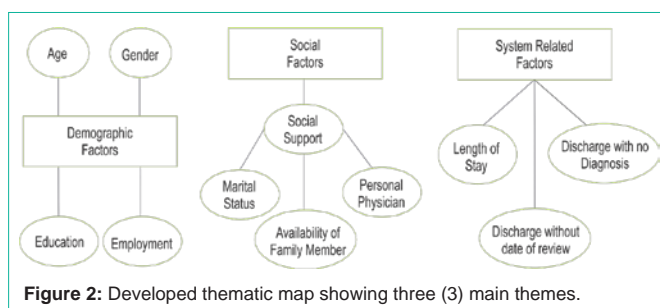
## Data Analysis

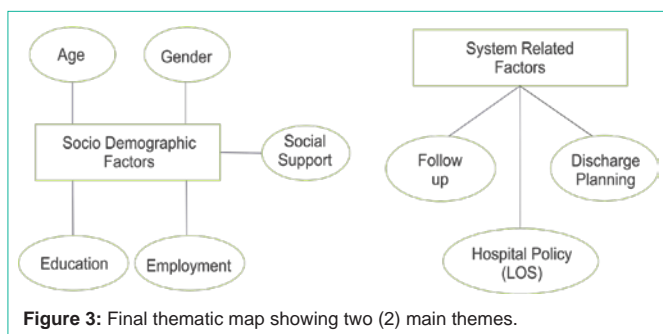
Data was analysed using thematic analysis [9]. Patterns of meanings of potential interest were looked for during the data collection process. Active reading and re reading of each article was done to identify key data. Interesting features identified across all the data were coded (Figure 2 and 3).

### Socio demographic factors and hospital readmission

Socio demographic factors have been known to affect the health status of the general population, most especially the elderly and consequently readmission rates [10]. Socio demographic factors will therefore include age, gender, social support, education and employment.

**Age:** Age has been known to be associated with readmission rates [11]. Research done in Hong Kong revealed a high hospital readmissions rate among the young age group than the elderly [12]. Similarly, research conducted in Nigeria reported that, out of 536 patients, 34% were readmitted and majority was between the ages of 19-62 years [13]. More so, research done in Kenya among 1,148





children revealed the following results: 107 readmitted twice, 36 readmitted four times, 12 readmitted five times and 9 at least six times [14]. Furthermore, a study [15] conducted in Cote d'Ivoire revealed higher percentage (87.8%) of readmitted cases being younger (<44 years).

On the contrary, another study conducted among patients with heart failure in Nigeria revealed a significantly higher rate of readmission among the elderly [16]. This is also confirmed by a study conducted in South Africa which revealed that out of 406 patients readmitted, 45% were above 80 years [17]. Zhou et al. [18] in a study conducted in China also confirmed an increase in readmission rates among the elderly than the young age groups. The difference in readmission rate may be due to differences in gender and thus the need to consider the impacts of gender on readmission rate.

**Gender:** Gender as a non-modifiable factor is also known in many studies to have an impact on readmission rates. Most studies done in developing countries revealed high percentage of readmitted cases being males [12,15-17,19], this confirms a similar study [20] results done in a developed country. However no study revealed increase in readmission rate among women in developing countries. Some studies also reported the impact of gender to be mixed [21]. Male gender can therefore be seen in both developed and developing countries as a predictor of readmissions. In as much as gender is a non-modifiable factor, what accounts for increased risk of male gender to readmissions may be other socio economic factors.

### Socio economic factors and readmission

**Employment and education:** Low socio economic status has been found to significantly increase the rate of readmission for an individual [21]. Studies conducted in some developing countries revealed high readmission rate among populations with low education, and unemployed [13]. Similarly study conducted in Cote d'Ivoire depicted a high rate (95.4%) of readmissions among individuals who were uneducated and 50.9% of readmissions among those who had no form of wage earned [15]. These studies are consistent with research conducted in some developed countries. The studies reported an increased risk of readmission among the unemployed or populations with low prestige occupations and less or uneducated populations as compared to privileged groups with high education and gainfully employed [23-25].

**Social support:** There is much evidence that, supportive social relations have an impact on health outcomes and that social support is essential for adjustment to illness [26].

An individual's social support with regards to marital status,

whether living alone or not has also been known to have an impact on readmissions prevalence [10]. Availability of family members, friends or social groups was also seen to reduce readmission rate [10]. Another study conducted in Hong Kong confirms how lack of social support increases an individual's risk to readmission [27].

Conversely, some studies done revealed high rate of readmission among patients with social support. This is evident in recent study [28] which demonstrated a high readmission rate among patients with heart failure who had family support. Similarly, Hasan et al. [29] in a cohort study revealed that social support was less predictive of readmission. Controlling for social support and other socio demographic factors alone is not enough to reduce readmission rate unless other system related factors are also considered.

**System related factors and readmission:** System related factors can therefore be referred to as the availability, accessibility and coordination of care in the health care delivery system [30]. It is known that system related factors such as unresolved treatment of medical problems during previous discharge may contribute to readmissions [31].

### Hospital policies

**Length of Stay (LOS) and readmission:** Hospital policies such as reducing patients LOS through premature discharge in order to reduce pressure on hospital bed is known to cause more harm than good as it is stated in recent studies that, reduction of length of stay was one of the consequences of high hospital readmissions [12,32]. In Western Cape Province in South Africa, a policy of reduction of LOS as an effective tool through an early crisis discharge policy to decrease bed pressure has rather led to high rate of readmissions, increase cost and increased bed occupancy [19].

On the contrary, findings from a research done in South Africa, Hong Kong and China respectively did not see reduction of length of stay as a factor for hospital readmission [17,18,33]. Similarly, Johnstone and Zolese [34] in a Randomised Controlled Trial (RCT) study posited that short LOS is not a marker of readmission rate if discharge planning is properly done.

In addition, findings reported from a research done in Nigeria showed that, 12.2% of 90 patients who had a short LOS were readmitted while the same percentage (12.2%) of 172 patients whose LOS was long were readmitted [16]. Thus, there was no difference between readmission rate among both short and long hospital stay patients. Halfon et al. [35] however in a study reported a positive correlation between long LOS and the risk for readmission.

**Discharge planning:** Many rehospitalizations are as a result of systemic failures in transition from hospital to the next source of care [27,36].

A recent study in a developing country revealed that the major reason for readmissions were lack of diagnosis or procedure not performed during first hospitalization [12]. This is supported by a research [37] which demonstrated that, out of 564 patients discharged to sub-acute care, 40% had their test results pending and this is known to predispose patients to readmissions. Factors identified to be the leading cause of readmissions has been known to be; patient's lack of knowledge regarding condition management, failure to consider

post-acute care transition and lack of follow up visits [25].

## Follow Up

Follow up is known to help in the reduction of readmission rate. This is evident in a pilot study conducted among diabetic patients which revealed a reduction of readmission after 2 to 5 days follow up visits were done post discharge [38]. Previous study [39] also supports follow up as a way of reducing readmissions and that was evident in a RCT study done. Additionally, a meta-analysis of 17 trials done depicted how home visit can help reduce readmissions and mortalities as well [40]. Patient education of condition management, pre-discharge assessment and domiciliary aftercare has been shown in a RCT as a way to prevent about 12% to 75% of all system related hospital readmission [41].

On the contrary, some studies conducted in developing countries did not show any significant reduction of readmissions among patients who had benefited from follow up visits after discharge from hospital [42].

## Discussion

### Age

Majority of the research done in developing countries [15,43-45] revealed high readmission rate among the young (<65 years) than the elderly (>65 years). This may be due to the fact that young ones are energetic and may involve in unhealthy activities which may worsen their conditions after discharge hence predispose them to repeated admission. Also, since the young may be in working force, they may not rest enough to recuperate from the sickness and may therefore return to work early so as to gain some income to support the elderly as supported by ICRW, where the youth working is seen as a source of families' future well being in terms of economic necessities.

Additionally, the young, especially between ages 10 to 24 years, are often perceived as contributing to society's problems, since they may engage in all forms of social vices which may put their health at risk.

More so, life expectancy of developing countries have been found to be low hence very few people live to the elderly age range (>65 years). An inference can therefore be made to suggest why the young (<65 years) have high readmission rate.

Conversely, some studies also confirmed a high readmission rate among the elderly [17,46,47]. This may be due to their decreased functional ability as supported by Yam et al. [48] who posited that aging population leads to increased burden of chronic diseases, multiple morbidities and disability and consequently increased in demand for healthcare. In addition, changes coupled with old age, such as change in smell and poor dental health, directly causes decreased in food intake which may also lead to decreased macro and micro nutrients and partly leads to poor health outcome [49] after discharge from hospitalization, thereby leading to rehospitalisation.

On the contrary, increase readmission among the elderly could also be due to the fact that elderly people report longstanding illness because they are more aware of their health and less resigned to limitations therefore prefers to report health complaints [50].

### Gender

Findings suggested male gender to be a risk factor to readmission [12,15-17,51]. The association may be linked to social behavioral patterns commonly associated with male gender, such as delayed health seeking behaviours, often resulting in episodic use of health services by men [52].

Moreover, the reason may be due to the fact that men are expected to be the families' bread winners. With this in mind, they work hard to fend for families even in their convalescent stage and this may affect their health negatively resulting in possible rehospitalisation. This is supported by Vlasoff who demonstrated how men have a greater involvement in paid labour force. Moreso, men usually engage in strenuous and unskilled occupations which predispose one to readmissions after discharge as confirmed by Verbrugge [53] who posited that men engage in more toxic occupational exposure than women.

Furthermore, men are perceived to be strong in some cultures and so are inhibited from verbalising minor ailments. This makes some men to harbour symptoms until it becomes severe resulting in increased rehospitalisation. This is supported by Courtenay and Keeling [54] who stated that optimistic perception of health status by men makes them place lower value on preventive care hence compounding problems which consequently leads to readmission. In addition, a study [55] establishes that men report less help seeking behaviours and engage in unhealthy lifestyle behaviours such as smoking and alcoholism which all worsen conditions leading to excess use of hospital services. Women, however, may not have increased readmissions due to the nature of work engaged in, lifestyle and the early reporting of even the minor symptoms to health facility [53]. Moreover, studies that depicted impact to be mixed among gender could be due to other factors such as socio economic or system related factors.

### Employment

Findings revealed a positive correlation between employment and readmission rate. Individuals unemployed had high a high readmission rate. According to Wilkinson and Marmot [56], unemployment puts one's health at risk and causes more illness which may consequently lead to increase readmission. For instance, an unemployed person may not have money to purchase prescribed medications and hence condition may deteriorate without discharged medications. More so, an individual who is poor may not be able to afford a balanced diet, thus will have poor nutritional status which will further reduce their immunity and lead to poor health outcomes even if discharged medications are available. This is supported by [56,57] who posited how insufficient dietary intake leads to malabsorption and diarrhoea with its associated negative effects thus increasing morbidity and mortality rates.

More so, the quality of job was seen in a study as also imperative to good health and this is supported by Wilkinson and Marmot [56]. This could be due to insecurity of job making one feel threatened coupled with psychological problems such as stress or anxiety which may impact on health negatively with probable readmission.

### Education

Educational attainment is positively correlated with wealth

and knowledge level with regards to disease management [58]. Uneducated individuals may therefore not have enough knowledge with regards to disease management and may resort to improper or unsafe ways of condition management such as seeking spiritual help and then reports to the hospital as a last resort. In Africa, for instance, uneducated individuals engage in superstitious beliefs by trying alternatives, such as traditional healers, and often visit the hospital as a last resort [16]. This health seeking behaviour worsens condition and may lead to readmissions. This is confirmed in a recent study [59] conducted in Uganda which indicated how lack of formal education had an association with all-cause mortality among PLWHA.

### Social support

Studies [26,27,60] depicted an inverse relationship between social support and readmission rate. From the studies, social support can be seen as a significant predictor of readmissions because social support provides emotional care, access to material goods or services and also information and advice on condition as supported by Luttik et al. [26], thus, the reason for high readmission rates among individuals who were socially isolated.

Also, presence of social support may enable early detection of any changes in conditions as confirmed by Luttik et al. [26].

In addition, available social support may protect patients from pathogenic influence of stress and thereby perceiving stressful events as less threatening hence, minimising the incidence of complications that may have been precipitated by stress Luttik et al. [26]. However, the fact that readmission rate was low among individuals with social support does not mean conditions did not recur, but it could be that health service was sought at other avenues such as native doctors and pastors.

Conversely, some studies also demonstrated a high rate of readmission among patients with social support [28,29]. This could be due to caregiver stress on patient as supported by Luttik et al. [26]. Similarly, Wilkinson and Marmot [56] posited that bad close relations can lead to poor health outcomes. For instance, a caregiver for an Asthmatic who smokes often in the patient's presence may have an impact on the condition of the patient and consequently increase chances of readmissions. Moreover, presence of family members may encourage minor exacerbations reporting and may lead to increase readmissions.

On the other hand, presence of some family members may discourage reporting conditions early to hospital but rather resort to other alternatives with the hospital being the last option as supported by Ogah et al. [16]. When this happens, conditions become deteriorated and may need readmission when reported back to the hospital.

Social support could not have any effect on readmissions as seen in a study [29]. This may be due to the different ways social support was operationally defined. Some studies may conceptualize social support as living alone or not [61], while others may refer to being married or not [60], and other studies may refer to how one is able to get physical support, information or advice [12,29]. Conceptualising social support in different ways may give different results. For instance, if social support is defined as living alone or not, someone may be living alone but may have a close friend whom he or she can

lean on for help at all times. In this case, the result may depict low readmission rate among individuals living alone when in actual sense the individual has social support.

### Hospital policy (LOS)

Studies revealed short length of stay as a factor for high readmission rates [12,32]. Considering the results from the studies, reduction of length of stay as a policy will not allow for full recovery of a patient's condition nor allow for adequate preparation for discharge thereby leading to increased readmission as supported by Segal, Akutsu and Watson [62].

Conversely, short length of stay was not seen as a predictor of hospital readmission in another study [34]. This could be due to factors such as the execution of efficient discharge planning, timely and regular follow ups, and the ability to procure the required discharged medications.

A study [35] which depicted high readmission among patients that had a long hospital stay could be attributed to hospital acquired infections, like influenza that was not detected during admission. However staying long in the hospital may not necessarily mean that discharge planning was done effectively and hence likely increase in readmission.

Further studies [12,17,18] did not find any correlation between length of stay and readmission rate. This result may be due to differences in hospital types and study populations [19].

### Discharge planning

Findings revealed how poor discharge planning led to increased readmission rates [37]. Factors identified, such as lack of adequate knowledge about a condition, may lead to increased readmission. For instance, if a diabetic patient is shown how to give insulin to control increased blood glucose levels without being educated on the management of low glucose level, one may report in a somatic state. This could have been prevented if adequate information was given. Improper discharge planning done may lead to the inability to detect medications on discharge, thereby leading to recurrence of condition which may be worsened and warrant readmission [63].

### Follow Up

Majority of the studies conducted depicted an inverse relationship between follow up and readmission rate. Follow ups may help to address unmet needs, detect abnormalities early and advice given before condition becomes severe to merit further admission. Knowledge about condition management is being reinforced, medication adherence confirmed, laboratory results are reported and the needed action taken accordingly during follow up.

Alternatively, a study did not see any significant reduction in readmissions when follow ups were embarked. Reasons could be that the follow ups were not done timely and regularly. This is supported by Wong et al. [16] who posited that most readmissions occur within two weeks and this two week "out-time" is a high risk time frame where follow ups should be intensive and regular. The result from the study could be due to the fact that the follow ups were done late when wrong interventions had already been done. For instance, when wrong dosage has been taken and medication is almost about completion. Also, it could also be that the health personnel had

**Table 2:** Summary of differences and similarities among studies reviewed.

Factors	Low Readmission Rate	High Readmission rate	No correlation
Elderly	Chan et al. 2011, Ve et al. 2010, Snow et al. 2000, Gbiri et al. 2011	Ogah et al. 2014, Schuurmansstekhoven, Whitelaw & Devonmeiring 1992, Zhou et al. 2014	
Gender (Male)	Verbrugge (1985)	Chan et al. 2011, Niehaus et al. 2008, Ogah et al. 2014, Schuurmansstekhoven, Whitelaw & Devonmeiring 1992, Ve et al. 2010	(Herzog 2003)
Unemployment and uneducated or lack of education		Ve et al. 2010, Burke et al. 2014, Jasti et al. 2008, Rubin et al. 2014	
Availability of Social Support	Luttik et al. 2005, Yam et al. 2010, Ve et al. 2010	Schwarz & Elman 2003, Hasan et al. 2010, Ogah et al. 2014	
Short LOS		Chan et al. 2011, Hammond, Pinnington & Phillips 2009, Segal, Akutsu and Watson (1998)	Johnstone & Zolese 1999
Long LOS		Halfon et al. 2002	
Poor discharge planning		Walz et al. 2011, Alper & O'Malley 2013	
Implementation of follow up	Seggelke et al. 2014, Elkan et al. 2001, Benbassat & Taragin 2000		Wong et al. 2008

limited knowledge about the discharge summary of the patient. This is why it is important for care pathway to be connected from hospital to community [12], so as to have adequate information about patient being discharged.

Early discharge planning, patient centered care, telephone follow up and multidisciplinary hospital based quality initiative were found to reduce readmissions. The possible reason why early discharge planning led to reduced readmissions may be the ability to identify early, patients that needed special planning in the course of hospitalization as supported by Inui et al. An inference that can be made regarding patient centered care is the fact that individuals tend to have a sense of power if they are involved in care and are likely to adhere to discharge instructions. This is supported by Baum [64] who stated that projects which involved active participation of those involved in the issue proved high success rate and was sustained (Table 2).

## Limitations of Study

This study can give an idea of the causes of readmission in developing countries; however a limitation of this study is the fact that results cannot be extrapolated to all developing countries due to differences in health systems.

Another study limitations is the heterogeneity of the sample in developing countries, it is a very large set of countries with very different economic, social and political situations.

## Strength of study

Findings from this study will provide a basis for assessment, planning interventions and follow up of medical patients so as to reduce avoidable readmission.

Secondly, factors identified will help inform policy makers and healthcare providers the need to incorporate a multidisciplinary hospital based quality initiative that involves communication and coordination between care teams from disciplines such as the pharmacy and social welfare since large component of the modifiable causes may be driven by social factors within an individual's environment.

## Conclusion

The impact of hospital readmissions is enormous extending from individual to family, healthcare providers and nation as a whole.

Out of the identified determinants of hospital readmission, policies aimed at improving follow up are likely to reduce readmission rate in majority of the determinants.

Policy initiative should therefore aim at providing a link between hospital care and community through regular and timely follow up which in turn will help identify early any complaints that was not addressed due to short stay and any gaps during discharge planning.

Furthermore, follow up could also be strengthened through the development of a database of contact details of public or community health nurses in catchment area of each district or sub district so that during discharge, the traceable address of patients can be communicated with the health worker either through phone calls or sending of text messages.

In addition, introduction of software for discharge can be implemented so that an automatic email including brief history about client, traceable address and the need to follow up within the first – second week post discharge will be sent.

Further research needs to be done to differentiate the determinants of readmission from African and Asian continents.

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