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Full Length Research paper

Estimating caesarean section rates in medical schemes, South Africa: A comparative study between 2008 and 2011

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ABSTRACT

Caesarean section rates in the private sector are reported amongst the highest in the world, these procedures are also reported to be costly to medical schemes. The objective of this study was to examine caesarean section rates in large and medium medical schemes in South Africa. This was a comparative cross-sectional study on the 2008 and 2011 data. Multivariate analysis of variance (MANOVA) was conducted to measure CS rate characteristics to factors such as scheme type, pregnancy rates in schemes and the average age of beneficiaries. The average age of beneficiaries in open schemes increased marginally from 30.0 in 2008 to 30.4 years in 2011; however there was slight ageing in restricted schemes from 29.7 2008 to 29.9 years in 2011. Median CS rate per 1000 deliveries increased from 618.2 IQR (546.2-677.0) in 2008 to 680.1 IQR (634.2-730.5) in 2011. Pregnancy rate also increased slightly from 2.5 IQR (1.9-3.5) in 2008 to 3.0 IQR (2.4-3.7) per 100 female beneficiaries in 2011. The current paper indicates an ageing phenomenon in child bearing beneficiaries; an increasing trend is also noted in caesarean rates. Covariates considered in the current study were not significantly associated with CS rates, thus indicating that other factors such clinical notes on CS rates; maternal perspective and provider perspective need to be explored further to enhance the understanding on drivers of increasing CS rates.

Keywords: Caesarean Section, Normal Vaginal Delivery, Prescribe Minimum Benefits.

INTRODUCTION

Caesarean deliveries are not funded by medical schemes (Medical schemes are insurance institutions that cover medical expenses in South Africa. These institutions reimburse their members for actual expenditure on health.) unless clinically motivated by the provider, yet caesarean section (CS) rates in the private sector are reported to be among the highest in the world, these conditions are also reported to be among the top 10 conditions that are costing schemes millions per year (Naidoo and Moodley, 2009). There are various indications for elective caesareans; in South Africa, for example, one of the reasons for an elective caesarean is HIV-positive status. This mode of delivery reduces the rate of mother-to-child transmission of HIV (Segurado and Paiva, 2007; Muula, 2008). Moyer et al. (2010) argue that even though caesarean section deliveries can be lifesaving for both mother and infant, their overuse is a cause for concern because of their association with increased maternal morbidity and mortality, cost, and the demands placed on scarce health-system resources.

There are multiple other factors associated with the increasing caesarean rates; these are explored in a recent study by Stavrou et al (2011). It is also stated in literature that caesarean section rates are also influenced by non-medical and potentially inappropriate factors (Matshidze et al., 1998; Cyr, 2006; Dhai et al., 2011). Other studies indicate that fear of litigation and a desire for safer deliveries are the primary reasons for conducting caesarean sections (Muula, 2007). Health-care professionals in other settings perform this

procedure routinely for perceived benefits of their own (Gibbons et al., 2010; Simpson and Thorman, 2005).

There are studies that contest the perception that CS is safer for the mother and/or infant, thus illustrating that this model of delivery does not necessarily improve the life quality of mothers (Huang et al., 2011). A study by Torkan et al. (2007) demonstrated that women undergoing normal vaginal deliveries (NVD) experience better quality of life post partum than those undergoing caesarean section. Torkan and colleagues further observe that some problems related to quality of life post caesarean section have not been given attention, including low back pain and perinatal pain. The later reviews dispute that CS is harmless and contest some of the perceived benefits of a CS.

Key focus

Medical scheme members are entitled to certain Prescribed Minimum Benefits (PMBs) that the schemes are obliged to cover in full (Medical Schemes Act, 1998). These include a maternity benefits package. Natural vaginal deliveries are covered by medical schemes; caesarean sections, however, are only covered if there are specific clinical reasons, such as the foetus being in distress or some other emergency. Despite this factor, elective caesareans still dominate and are increasing in medical schemes.

Objectives

The objective of this study was to examine recent data on caesarean sections performed on the medical schemes population, in particular that of schemes with more than six thousand principal members.

METHODS

Materials

The data used were sourced from the statutory returns submissions that schemes submit annually.

Setting

Data included open and restricted schemes that were registered during the assessment period. The assessment period was data observed in 2008 and in 2011. The inclusion criteria were that schemes must have more than 6000 principal members and have submitted complete and reliable demographic data and maternity.

Design

The study was a descriptive cross-section study that included large and medium medical schemes that were registered in 2011. A purposive sampling frame was used to select beneficiaries to be included in the study. Purposive sampling techniques involve selecting certain units or cases ‘‘based on a specific purpose” rather than randomly (Tashakkori and Teddlie, 2003). For the purpose of this study we selected female beneficiaries of large and medium schemes; large schemes were defined as schemes that have beneficiaries greater than 30 thousand. Medium schemes were defined as schemes with more than 6000 members and less than 30 thousand beneficiaries. The study was representative in terms of covered female lives.

Procedure

The total number of caesarean sections in schemes was extracted from the utilisation section of the annual statutory return data submissions. This was then weighted to account for the number of female beneficiaries in each scheme. The average age of female beneficiaries was computed at scheme level. Other covariates considered for predicting the proportion of female beneficiaries in schemes included the average number of pregnancies per scheme. Table 1 depicts variables that were considered in the study.

Statistical analysis

Descriptive statistics such the medians and interquartile range (IQR) were reported to describe the data. Multivariate analysis of variance (MANOVA) was also conducted to measure CS rate characteristics to factors such as scheme type, pregnancy rates in schemes, the proportion of female beneficiaries in schemes, and the average age of beneficiaries (Hochberg et al., 1987; Westfall et al., 1999). We conducted all the analysis using SAS software, version 9.2 (SAS Institute Inc., Cary, NC). Statistical significance tests were conducted at $\alpha = 0.05$ significance level.

RESULTS

The sample included 25 and 21 open schemes, 32 and 30 restricted schemes in 2008 and 2011 respectively. The study population consisted of 3.6 and 3.9 million female beneficiaries in 2008 and 2011 respectively, which represented 87.7 and 86.7% of all female beneficiaries respectively.

Table 1: Variables under investigation

Caesarean rates	Number of caesareans per pregnancy/ 1000 deliveries
Scheme type	
Open scheme	Medical schemes that freely admit everyone
Restricted schemes	Employer group schemes, these schemes only admit applicants belonging to a specific employment sector.
Scheme size	
Large and Medium	Large medical schemes was defined to have more than 30 thousand beneficiaries (Beneficiaries included both principal members and dependents belonging to a scheme) were classified as large schemes. Medium schemes was defined to have more than six thousand principal members and less than 30 thousand beneficiaries.
Pregnancies rate per scheme (%)	Number of pregnancies adjusting to all females in the scheme. The denominator in computing pregnancy rate excluded female age groups, < 10 years and > 50 years of age
Female beneficiaries rate (%)	Number of female beneficiaries in the scheme adjusting for all beneficiaries in the scheme
Average age of beneficiaries (yrs)	Average age of beneficiaries at scheme level

Source: Willie, 2012

The average age of beneficiaries in open schemes increased marginally from 30.0 in 2008 to 30.4 years in 2011; however there was slight ageing in restricted schemes from 29.7 2008 to 29.9 years in 2011.Median CS rate per 1000 deliveries increased from 618.2 IQR (546.2-677.0) in 2008 to 680.1 IQR (634.2-730.5) in 2011. Pregnancy rate also increased slightly from 2.5 IQR (1.9-3.5) in 2007 to 3.0 IQR (2.4-3.7) per 100 deliveries in 2011. There was a positive correlation between open schemes CS rates and pregnancy rates in 2008 (p=0.035). However this was not the case in 2011. Results of the multivariate analysis of variance (MANOVA) results did find any significant association between CS rate characteristics and pregnancy rates in schemes, the proportion of female beneficiaries in schemes, and the average age of beneficiaries.

DISCUSSIONS

The objective of the current study was to assess and report on recent caesarean rates in medical schemes, in particular schemes large and medium schemes. CS section is only covered if it is linked to clinical conditions or in emergencies. Despite the fact that this condition is not fully covered, continued increases are observed in schemes. This comparative study illustrates and increasing trend of CS rates for the period under review. These results are consistent with the trends reported in literature (Naidoo and Moodley, 2009; Willie, 2012). The study considered a larger sample size of medical schemes than one explored by Willie (2012).

CS rates were positively correlated with pregnancy rate in open schemes (p=0.035), however this was only evident in 2008, we did not find any significant association between the average age of beneficiaries and caesarean rates, although other studies have found a close association between maternal age and elective caesarean section (Bell et al, 2001; MacDorman et al., 2008). Open schemes had an older age profile and increased marginally from 30.0 to 30.4 years. Aging of females was also noted in restricted schemes from 29.7 in 2008 to 29.9 years in 2011.

We did not find any significant association between the average age of beneficiaries and the pregnancy rate. This was not consistent with the reviewed literature, fo example Seng et al. (2005) found an association between age and fertility in older women: in women older than 40, pregnancy and live-birth rates fall, with a concurrent rise in miscarriage and cycle cancellation rates. According to a study conducted by Dunson et al. (2004), pregnancy rates decrease steadily with increasing age of the woman.

Limitations of the study

The current study was a comparative explorative study on reported caesarean sections in schemes during 2008 and 2011. Due to data limitations, no distinction was made between elective and non-elective CS rates.

Another limitation of the current study is that we only controlled to a limited set of covariates, thus a comprehensive study on clinical indicators linked to

caesarean section needs to be conducted , this also include doctor perspective. Kiliç (2012) illustrated that majority of women had a caesarean delivery following provider advice. The author also concludes that higher caesarean rates may be due to provider indication that this procedure is routine, rather than objective medical criteria. In contrast, a study by Zhang et al. (2008) found maternal requests for CS to be a leading contributor to increased caesarean rates.

CONCLUSION

Our study and preliminary data shows that CS rates are high in medical schemes and therefore need to be reduced. The factors we investigated, especially the average age of beneficiaries and pregnancy rates appear to have a little impact on CS rates. This finding suggests that alternative approaches such as educating scheme members about the risks involved, and employing rigorous managed care initiatives to control procedures that are not clinically motivated, are essential.

RECOMMENDATIONS

The data presented revealed that pregnancy rates, proportion of female beneficiaries in the schemes and the average age of beneficiaries had no effect on increasing caesarean rates. Thus, revealing that other covariates need to be explored to further understand the increasing caesarian rates in the private sector.

Though caesarean section is a preferred mode of delivery as attested by increasing rates, patients or beneficiaries still need to be informed of the risks involved. It is also recommended that beyond patient and staff education, managed care programs could be employed as an auditing tool to ensure that caesareans are clinically appropriate. Other initiatives that could be employed include making it mandatory to seek a second opinion and peer review before a caesarean is conducted (Muula, 2008a; Runmei et al., 2012).

It is therefore recommended that a reduction in litigation pressure would be likely to lead to a reduction in the number of caesarean sections carried out (Vincent et al., 1994; Yang et al., 2009; Kealy et al., 2010). Arjun (2008) further asserts that educating obstetricians, pediatricians and lawyers can have an effect in curbing rising caesarean rates.

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