Reviewer’s report

Title: Effect of Diagnosis Related Groups Implementation on the Intensive Care Unit of a Swiss Tertiary Hospital: a Cohort Study

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Reviewer: Duncan Young

Reviewer’s report:

This is a study of the effects of implementing the (Swiss)-DRG on ICU admission numbers, severity of illness, in-ICU mortality and duration of ICU care in a single large teaching hospital. The underlying hypothesis was that the link between DRG and hospital funding might result in a change in ICU patient characteristics caused by finance-related patient selection. The study showed little effect of DRG implementation on ICU activity.

The study used records from 2009 to 2013, giving data for three years pre-DRG and ten months after. Further data after DRG implementation was not available due to a change in acute care provision in October 2013 at the hospital. The "pre" data were adjusted to remove data from October to December to match the incomplete 2013 data. The authors used modelling to predict ICU admissions in 2013 from the pre-DRG data and compared the results with the observed data.

Though not explicitly stated, this seems to be the first study of the effects of DRG introduction on ICU care. There are no other ICU-specific studies cited in the discussion.

I have a few general comments about this study. I am not strained in statistics and have no knowledge of the Swiss healthcare system and my comments should be interpreted with this in mind.

I expect that most changes seen when hospital systems move to DRG-based reimbursement will be in the activity that the hospital can easily control, like the high-risk elective surgical population. "Gaming" ICU admissions is much harder if they are emergency admissions or the care system is hierarchical with centralisation of some services like ECMO, neurosurgery etc. I would have been surprised if a change to DRG-based remuneration had a major effect on the emergency workload of an ICU. The manuscript might be improved by some brief comments on the mechanism by which a change to DRGs feeds through to ICU admissions. In the Discussion the authors say "We only detected minor effects of SwissDRG especially on admission policies......". If the hospital had changed admission policies in response to DRGs this would have been one such mechanism. However, I would be surprised if the ICU explicitly changed its admission policy.

There is no "limitations of this study" paragraph in the discussion. There are two obvious limitations, the paucity of post DRG data compared with pre-DRG data and the exclusion of half of the winter season, typically the busiest for ICUs. Whilst I understand that more post-DRG
data were not available, this is still a limitation. There are also almost certainly assumptions made in the models used that are not explicitly mentioned.

The authors say "In patients with low severity of disease in-house admissions became more frequent than expected whereas external admission were less frequent". I suspect these two are linked. Most ICUs are resource-constrained (too few beds) and run at high occupancy. If external referrals were reduced it is likely that the capacity would be used for in-hospital patients. I don't think they should be viewed as separate findings, one was the driver and the other followed.

Duncan Young

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

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Yes

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