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Adapting the ACG Case-Mix System to Swedish Health Care - creating Swedish weights

Andreas Johansson, M.Sc. Ensolution AB
Henrik Magnusson, M.Sc. Statistician Linköping University
Lars Borgquist, Prof. MD, Linköping University

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Background

- Sweden has been one of the early international adopters of the ACG-Case Mix System.
- In 2008 a new reform was introduced in the Swedish health care system which made it possible for patients to freely choose a health care provider in the primary health care.
- With the introduction of the freedom of choice model, a need of risk adjusted resource allocation system emerged. All county councils in Sweden have to establish a system where resources follow the individual patient.
- This has lead to a demand for the ACG Case-Mix System which now covers roughly 60 percent of the inhabitants in Sweden (9 Mill 2009).
- As a consequence Swedish weights for the ACG Case-Mix System have been created. A joint project between the Swedish Association of Local Authorities and Regions, the University of Linköping, Ensolution AB (the ACG distributor) and Johns Hopkins University for localizing the system was therefore initiated.

Aim of the project

- To create Swedish weights for the ACG Case-Mix System

Methods

- Three different weights lists were created with the following combinations of costs and diagnoses:
- All diagnoses set (in- and outpatient care and primary health care) and total costs [All dx & All costs]
- All diagnoses set (in- and outpatient care and primary health care) and primary health care costs [All dx & PHC costs]
- Diagnoses set in primary health care and primary health care costs [PHC dx & PHC costs]

Scope [1/2]

- The need of three different weights lists emerged since there were different scopes for the resource allocation system on county council level. When there was the need of allocating resources on the primary health care level; the US weights did not correspond to the resources used on the primary health care level.
- There was also different working practice in Sweden compared to the US for certain ACG groups, i.e. pregnancy. The Dx-PM was also not useful for Swedish conditions since the absolute cost levels between the US health care system (insurance-based) and the Swedish (state-funded) were different. The main incentive for doing the adaption was the need of developing the weight lists for the primary health care level.

Scope [2/2]

- Sweden does not have an insurance-based health care system. Therefore the county councils have no costing processes in place to handle claim data. Most county councils in Sweden have developed micro-costing data (Cost per patient) for the purpose of following the patient's costs and the value-chain.
- The County Council of Östergötland, in south-east Sweden, has the most extensive cost per patient database in Sweden. It covers all levels of the health care system in Östergötland with a population of 425.000 inhabitants. Östergötland is also representative for whole Sweden concerning the representation of age and gender. The following steps were performed in the project

Steps

- Decision on design of the weight lists
- Collection of cost data and diagnosis for the years 2005-2007
- Adapting the data to the ACG Case-Mix System
- Running the ACG Case-Mix System
- Trimming the cost data
- Validation of the results
- Presentation and distribution of the results to the users

Example from weight lists

ACG code	ACG description	PHC dx & PHC costs [2007]	All dx & All costs [2007]	All dx & PHC costs [2007]
0100	Acute Minor, Age 1	1.038	0.325	0.898
0200	Acute Minor, Age 2 to 5	0.833	0.235	0.717
0300	Acute Minor, Age 6+	0.911	0.255	0.675
0400	Acute Major	1.121	0.508	0.608
0500	Likely to Recur, w/o Allergies	0.964	0.342	0.673
0600	Likely to Recur, w/ Allergies	0.792	0.274	0.620
0700	Asthma	0.910	0.289	0.645
0800	Chronic Medical: Unstable	2.588	1.452	0.705
0900	Chronic Medical: Stable	1.532	0.450	1.033
1000	Chronic Specialty: Stable	1.273	0.431	0.605
1100	Eye & Dental	0.891	0.368	0.205
1200	Chronic Specialty: Unstable	1.112	0.383	0.351
1300	Psychosocial, w/o Psychosocial Unstable	1.393	0.623	0.898
1400	Psychosocial, w/ Psychosocial Unstable, w/o Psychosocial Stable	1.789	2.304	0.556
1500	Psychosocial, w/ Psychosocial Unstable, w/ Psychosocial Stable	2.577	3.777	0.764
1600	Preventive/Administrative	0.776	0.149	0.205
1711	Pregnancy: 0-1 ADGs, delivered	*NA*	2.504	0.066
1712	Pregnancy, 0-1 ADGs, Not Delivered	0.726	0.336	0.124
1721	Pregnancy: 2-3 ADGs, no Major ADGs, delivered	*NA*	3.073	0.508
1722	Pregnancy, 2-3 ADGs, no Major ADGs, Not Delivered	1.975	0.965	0.578
1731	Pregnancy: 2-3 ADGs, 1+ Major ADGs, delivered	*NA*	3.920	0.337
1732	Pregnancy, 2-3 ADGs, 1+ Major ADGs, Not Delivered	0.596	1.445	0.488
1741	Pregnancy: 4-5 ADGs, no Major ADGs, delivered	*NA*	3.909	1.089
1742	Pregnancy, 4-5 ADGs, no Major ADGs, Not Delivered	3.187	1.833	1.245
1751	Pregnancy: 4-5 ADGs, 1+ Major ADGs, delivered	*NA*	5.314	0.849
1752	Pregnancy, 4-5 ADGs, 1+ Major ADGs, Not Delivered	1.693	3.112	1.202
1761	Pregnancy: 6+ ADGs, no Major ADGs, delivered	*NA*	5.065	1.891
1762	Pregnancy, 6+ ADGs, no Major ADGs, Not Delivered	3.109	2.782	2.290
1771	Pregnancy: 6+ ADGs, 1+ Major ADGs, delivered	*NA*	7.287	1.909
1772	Pregnancy, 6+ ADGs, 1+ Major ADGs, Not Delivered	3.174	4.295	2.367

Validation

ACG2 - All dx & All costs - Dependent variable: Total Health Care cost 2007 (standardized)

Model Summary	US		Local	
	dxpm_nocost_tt_prir	dxpm_ttcost_tt_prir	Model markers	Model markers with prior costs
R	0.400	0.430	0.439	0.466
R^2	0.160	0.185	0.192	0.217
Adj R^2	0.160	0.185	0.192	0.217
S. E. of Estimate	2.738	2.697	2.686	2.645

ACG3 - All dx & PHC costs - Dependent variable: PHC cost 2007 (standardized)

Model Summary	US		Local	
	dxpm_nocost_tt_prir	dxpm_ttcost_tt_prir	Model markers	Model markers with prior costs
R	0.377	0.476	0.518	0.590
R^2	0.142	0.227	0.268	0.348
Adj R^2	0.142	0.227	0.268	0.348
S. E. of Estimate	1.771	1.681	1.636	1.544

Results

- Results did not differ substantially from the US weight lists.
- The Swedish weights contribute to a more relevant system for Swedish conditions. This was especially important for the use of a weight list for primary health care and for certain ACG groups.
- Work is in progress to include the results as a Risk Adjustment Variable (RAV) as a part of the ACG Case-Mix System

Contact

- Web Site:
  - www.ensolution.se (Nordic countries)

- Contact:

Andreas Johansson, Ensolution AB
andreas.johansson@ensolution.se
Mbl +46 709-900030

Henrik Magnusson
Linköping University
henrik.magnusson@liu.se