RISK STRATIFICATION AND PREDICTIVE MODELLING – THE ACG SYSTEM

Adjusted Clinical Groups (ACGs) ® were invented by Professor Barbara Starfield as a primary care workload and case management tool. Developed with her colleagues at Johns Hopkins over the last 30 years, the ACG System is now the international market leader in population risk profiling and in use on all five continents. The ACG System is currently being deployed in 12 PCTs in the NHS serving over 5 million people.

Predictive models identify individuals and groupings within a population who are expected to be high utilisers of health care resources, predominantly people with long-term conditions. However predictive modelling is just one of the strategic information needs to support evidence based commissioning and service delivery. Population risk profiling is defined as the process by which the health status of a population is measured for planning services, equitable budgeting, resource management and assessing outcomes. The ACG System is designed to meet all of these needs from one data set and one clinically-inspired analytics tool.

The ACG System is a suite of tools which draw on demographic, diagnostic, pharmacy and utlisation data from primary and secondary care. The primary care utilisation data includes GP attendances, prescribing, diagnostics, and referrals; secondary care includes admissions, bed days, A and E attendances. From this combined data base, several case mix or risk measures can be derived – both current and prospective. These begin with the individual patient and then are aggregated to each GP list, to practice-level, to Clinical Commissioning Groups (CCGs), and to PCT cluster etc. The ACG System has several applications:

ACG Predictive Model identifies the top 1%, 5% or 10% of high-needs, high-costs patients within a population. Predictive modeling is a key stage in an evidence-based intervention focused on the population who suffer multi-morbidity and other psychological and social needs. 5% of the population account for over half the NHS resource use, mostly unscheduled admissions to hospital.

The tool provides a list of these patients which is refreshed every 1 to 3 months. However in order to aid patient prioritisation and assessment of outcomes, the tool also provides a profile of each patient. This profile includes the patients risk score, costs, diagnoses and utilisation of both primary and secondary services. Hence it can be used by the clinicians providing the care as part of an individualised care plan. Also by trending the cost and utilisation data, the ACG System automatically monitors the impact of any intervention over time on these important outcome measures.

Patient Clinical Profile Report

Patient ID	[redacted]	ACG 4430	
GPPractice		4-5 Other ADG Combinations, Age > 44, 2+ Major ADGs	
Descriptive		**Prior Costs**	
Age	64	Total Costs	£4,940
Gender	M	Local Concurrent ACG w	4.87
RUB	4		
Special Markers		**Predictive Values**	
Major ADGs	2	Year 2 Predicted Weight	17.92
Chronic Conditions	6	Probability High Cost	0.95
Hospital Dominant Condi	3	Probability High Pharmac	-
Frailty Flag	N	rescaled_pharmacy_cost	0.05

Selected Conditions Profile

Asthma	NP	Chronic Renal Failure	NP	Hypertension	ICD
Arthritis	NP	Depression	NP	Ischemic Heart Disease	ICD
CHF	ICD	Diabetes	NP	Low Back Pain	NP
COPD	NP	Hyperlipidemia	NP		

Utilisation

Different Drugs	19		
Drug Prescriptions	62		
GP Attendances	23	Total GP Attendance Cos	£1,058
Outpatient Attendances	3	Total Outpatient Cost	£522
Inpatient Admissions	2	Total Inpatient Cost	£3,360
		Grand Total	£4,940

Evidence-based practice Predictive modeling is a key stage in long-term condition management which improves quality and patient satisfaction, but also reduces both secondary and primary care workload and costs. As the ACG System is primary-care based, it facilitates the close working between the LTC service and the patients' GP which is essential to achieving these outcomes. Also if the clinicians managing the patients have regular feedback on their utilization of service, they are more likely to show a return on investment. Such best practice models which the ACG System can support include "Guided Care" and the virtual ward.

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