

# Financial Risk and Volatile Childhood Diagnoses

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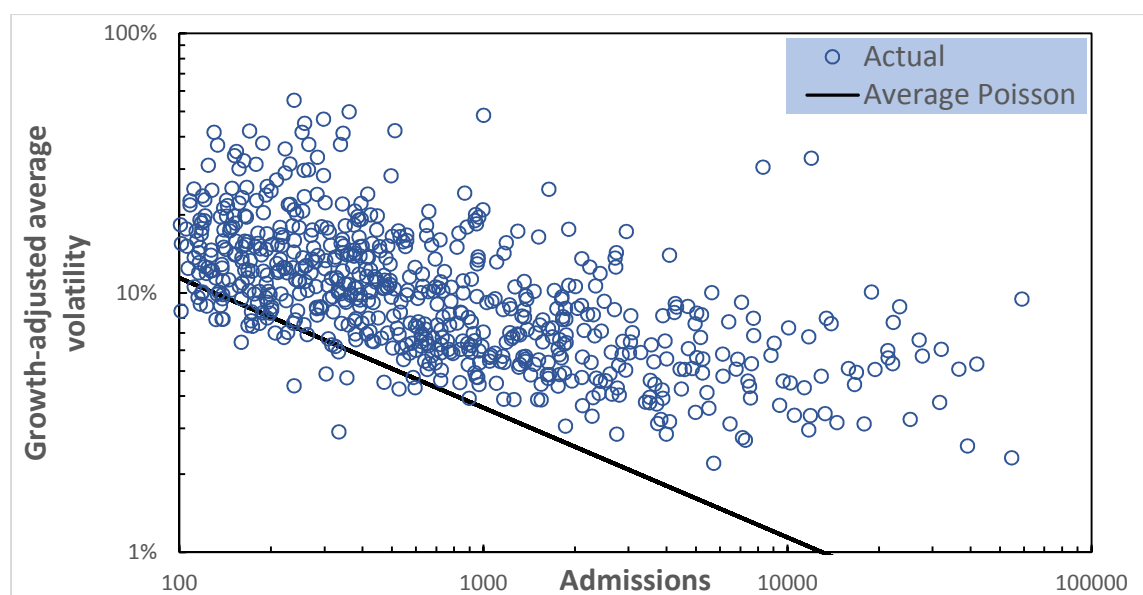
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**Rod Jones, statistical advisor discusses the volatility in admissions for children and the link with financial risk in commissioning**

The essence of financial risk lies in the relative volatility of any system; be it share prices or health care commissioning. Highly volatile systems are hard to predict and can show non-standard trends over time. Unexpected losses/surpluses can occur due to chance.

February's BJHCM investigated the volatility associated with elderly (age 75+) diagnoses (Jones 2013b). End of life implies declining immune and other body system function and hence increased sensitivity to the ever changing external environment which will include weather, pollution and infectious outbreaks (Jones 2013a). At the other extreme of age young children are acquiring immunity to various environmental challenges (mainly infectious) and are likewise expected to exhibit high year-to-year volatility in admissions, case mix and costs.

**Figure 1: Volatility of childhood diagnoses**



Footnote: The line for average Poisson variation was calculated using Oracle Crystall Ball Monte Carlo simulation. At local level volatility will be higher since the number of admissions will be smaller. Higher volatility for diagnoses with more than 10,000 admissions is due to heterogeneity within the diagnosis. Some diagnoses will contain additional volatility due to counting, coding and service change.

Figure 1 demonstrates that the volatility associated with childhood (age 0-14) diagnoses is generally very high, indeed more so than for the elderly diagnoses. This is not surprising since paediatric admissions are notoriously erratic and therefore exceedingly difficult to commission. Note that the only diagnoses not sensitive to the external environment are the minority close to the Poisson average line. Recall that this is a national picture and at smaller local level additional Poisson variation and local environmental conditions lead to appreciably higher volatility. The fact that there are 200 CCG's implies a minimum of a 14-times increase in volatility.

**Table 1: Top 25 high volatility admissions**

ICD	Description	Admissions	Not Growth Adjusted		Growth Adjusted	
			Raw	Intrinsic	Adjusted	Intrinsic
A08	Viral and other specified intestinal infections	27,067	8%	39%	7%	34%
A87	Viral meningitis	511	43%	31%	42%	30%
B34	Viral infection of unspecified site	58,951	11%	85%	9%	73%
E76	Disorders of glycosaminoglycan metabolism	1,638	44%	56%	25%	32%
H65	Non-suppurative otitis media	22,146	7%	32%	5%	25%
I12	Hypertensive renal disease	298	49%	27%	47%	25%
J03	Acute tonsillitis	36,600	8%	48%	5%	31%
J05	Acute obstructive laryngitis and epiglottitis	11,958	33%	115%	33%	114%
J06	Acute upper respiratory infections	41,887	6%	38%	5%	34%
J10	Influenza - identified influenza virus	1,648	138%	178%	138%	178%
J11	Influenza virus not identified	361	55%	33%	50%	30%
J18	Pneumonia organism unspecified	13,405	8%	29%	8%	28%
J21	Acute bronchiolitis	32,048	8%	44%	6%	34%
J22	Unspecified acute lower respiratory infection	21,376	8%	36%	6%	28%
J35	Chronic diseases of tonsils and adenoids	13,904	10%	38%	8%	28%
J45	Asthma	23,356	10%	46%	9%	43%
K52	Non-infective gastroenteritis and colitis	21,420	6%	27%	6%	26%
N18	Chronic renal failure	2,949	30%	51%	17%	30%
P20	Intrauterine hypoxia	27,763	6%	32%	6%	30%
R06	Abnormalities of breathing	18,862	11%	46%	10%	44%
R69	Unspecified causes of morbidity	8,301	33%	95%	30%	88%
Z03	Observation and evaluation	22,251	14%	66%	8%	36%
Z09	Follow-up after treatment (non-malignant)	4,088	18%	36%	14%	28%
Z23	Immunization - single bacterial diseases	238	44%	22%	44%	22%
Z75	Problems related to medical facilities	7,050	10%	28%	9%	24%
Z85	Personal history of malignant neoplasm	1,000	48%	48%	48%	48%

Footnote: Intrinsic volatility is the volatility equivalent at 1,000 admissions, i.e. Actual volatility x square root (admissions/1,000). Data sources and methods as per Jones 2013b.

Table 1 lists the top 25 highest volatile diagnoses. The top 50 account for 60% of childhood admissions while the 50 least volatile diagnoses only account for 0.6% of admissions, i.e. the risk is driven by high volume volatile events. As expected there are numerous diagnoses of an infectious/winter/air quality/respiratory nature. Note the very high volatility for influenza related admissions. This is due to levels of influenza being at a 100 year minimum between 2000 and 2008 and the subsequent international swine flu epidemic of 2009 led to a huge spike in admissions.

Has the Department of Health (now the NHS Commissioning Board) demonstrated an understanding of these issues? The answer is a troubling, no. The paediatric HRG tariff is poorly suited to commissioning as it makes no distinction between short and long stay

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admissions (Jones 2011a,b, 2012a). Indeed a fee for service tariff only magnifies the basic admission-based volatility. There is no apparent recognition that the financial management of highly volatile events cannot be squared with the insistence for a balanced budget in every year. Much needed risk sharing between CCGs (Jones 2012b) is receiving scant attention and failed management and resource allocation models of the PCT era seem to be carried forward with no apparent lessons learned (Jones 2013a,b). It would seem that management-by-blaming-others is more preferred to the self-scrutiny needed at the DH and its arms-length bodies. At the end of the day there is nothing to be gained from ignoring reality and pretending the world behaves in a policy-convenient way.

## References

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