

**26<sup>th</sup> Meeting of the Wiesbaden Group on Business Registers  
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Stats NZ (Statistics New Zealand)

Session 8 – Output of Statistical Business Registers

**Confidentialising Business Demography output tables using the Noise for Counts and Magnitudes (NCM) method – Frances Krsinich**

**Abstract**

*(300 – 500 words)*

*Keywords: Confidentialisation; Business Demography*

Statistics NZ is using an ‘input perturbation’ approach to confidentialising business demography tables called the ‘Noise for counts and magnitudes’ (NCM) method.

Input perturbation involves adding a small amount of ‘noise’ to the data at the unit (ie business or person) level, in such a way that the tables derived from this perturbed data are unbiased and contain as much information as possible while targeting protection to the sensitive cells.

Perturbation methods are being used in production by a number of other official statistical agencies. In particular, the US Census Bureau uses a ‘noise infusion’ method to protect longitudinal employment data (Abowd *et al*, 2012), and the Australian Bureau of Statistics use noise in the protection of frequency tables accessed via their remote server TableBuilder (Chipperfield *et al*, 2016).

This approach was first considered by Statistics New Zealand for the case of business survey magnitude tables (Krsinich and Piesse, 2002) with an application to count data researched by Groom and Camden (2013).

[Business Demography Statistics](#)

Business Demography statistics are derived from Statistics NZ’s Business Register and comprise of statistics based on two of the Registers’ statistical units, the enterprise (ENT) commonly known as the business and the geographic unit (GEO) commonly known as the business location. It produces a longitudinal series of statistics based business counts (counts of enterprises and geographic units) and business employee counts (employee counts of the enterprise or geographic unit) by a variety of business and regional classifications

### A coordinated approach

We have developed an approach which perturbs both count and magnitude tables – the NCM method - and this is being considered more widely across the organisation as part of the development of an automated confidentiality service.

Note that, in the context of Business Demography, the respondent whose confidentiality is being protected is the business. This means that tables of employee counts are considered magnitude tables, as the number of employees is a magnitude with respect to the business.

### How it works

Each business is assigned a random number uniformly distributed between 0 and 1. This random number is fixed across time to ensure the same degree of perturbation is applied to the business over time.

See section 2 for an example of the basic NCM approach, and section 3 for details of how the NCM method is adapted for the specific case of Business Demography data.

### The benefits

The benefits of this NCM method are that:

1. there will be no suppressed data cells, and
2. related tables will be consistent with each other – that is, the same cell in related tables will have the same value.
3. The method is very easy to implement

Feedback from Business Demography data has been very positive – the method is now being used for other Stats NZ outputs such as our Agriculture Statistics.

### References

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