

DEPARTMENT OF HEALTH & HUMAN SERVICES  
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**OFFICE OF THE ACTUARY**

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**To:** Medicare Advantage & Prescription Drug Plan Sponsors and Certifying Actuaries

**From:** Paul Spitalnic, Director, Parts C & D Actuarial Group

**Date:** February 21, 2013

**Subject:** Proposed Update to the Guideline for Full Credibility  
as used in the MA and Part D Bid Pricing Tools

CMS Office of the Actuary (OACT) is proposing to update the guideline for full credibility, as used in the MA and Part D Bid Pricing Tools (BPTs). These updates will be effective starting with the contract year (CY) 2014 BPTs. The proposed and existing guidelines are summarized as follows:

	Base Period Member Months	
	MA BPTs	Part D BPTs
<b>Proposed guidelines for full credibility (starting CY2014):</b>	<b>24,000</b>	<b>18,000</b>
Existing guidelines for full credibility (CY2006–CY2013):	24,000	12,000

CMS will accept comments through COB Friday, March 1, 2013 in order for CMS to continue the development of the CY 2014 BPTs and bid instructions to meet the expected production release on April 5, 2013. Any comments must be reported to CMS via the current website for the beta testing of the BPTs at [http://comments.cms.fu.com/BPT2014\\_Beta/bptbeta\\_start.asp](http://comments.cms.fu.com/BPT2014_Beta/bptbeta_start.asp).

Background

The existing guidelines for full credibility were developed prior to 2006. An analysis of Medicare Part A and Part B claims from calendar year 2002 was used as a proxy to develop the credibility guideline for MA BPTs. The guideline for Part D BPTs was set relative to the MA guideline based on expectations established by OACT.

Given that there is sufficient actual experience since the implementation of Part D, OACT has decided to evaluate the guidelines based on current experience. We will also give consideration to the degree of change between the existing and proposed guidelines.

## Synopsis of the Methodology

Based on an application of classical credibility theory, the determination of full credibility depends on the assumed variation in the claim experience. Our goal is to determine the number of individuals in a group that are needed to have a probability, P, of being within a percentage, k, relative to the expected claim amount. OACT has chosen values of P = 95% and k = 10%, consistent with the assumptions used to set the existing guidelines.

We model the distribution of claim amounts using the following statistical formula and the *Central Limit Theorem*:

Aggregate claims for a group of n individuals =  $\sum_{i=1}^n X_i \xrightarrow{d} N(n \times \mu, n \times \sigma^2)$ , where

$X_i$  is the annual claim amount with mean ( $\mu$ ) and variance ( $\sigma^2$ ) for an individual, calculated on a per capita basis.  $X_i$  is assumed to be independently and identically distributed for each individual. We calculated the mean and variance from historical claim experience from Parts A and B combined (as a proxy for MA) and separately for Part D. Claim amounts were tabulated consistent with the definitions used in the BPTs. We reviewed five calendar years of experience from 2007 through 2011 for consistency and trends over time,

n is the number of individuals in the group, and

$N(n \times \mu, n \times \sigma^2)$  denotes the *Normal* distribution with mean,  $n \times \mu$ , and variance,  $n \times \sigma^2$ .

Given our definitions and assumptions above, we solve for the following probability:

$$\text{Probability } [(1-k) \times n \times \mu \leq \sum_{i=1}^n X_i \leq (1+k) \times n \times \mu] = 95\%$$

By symmetry of both the *Normal* distribution and our probability statement, we can write the following relationship:

$$n \times \mu \times k = \sqrt{n} \times \sigma \times z_{0.975}, \text{ where}$$

$z_{0.975}$  is the z-score for the 97.5<sup>th</sup> percentile of the standard Normal distribution ( $z_{0.975} \approx 1.960$ ).

Substituting for the known variables and solving for n produces the following equation:

$$n = \left( \frac{1.96 \times \sigma}{0.1 \times \mu} \right)^2$$

Since n is defined on a per capita basis (per enrollee regardless of the number of months enrolled during the year), we convert the final result to member months by multiplying n by an assumed average number of months of exposure per enrollee per year.

Results Based on Recent Experience

A summary of the results based on actual calendar year experience is as follows:

Year	Parts A and B combined as a proxy for MA			Part D		
	$\sigma/\mu$	Average Monthly Exposure	Full Credibility*	$\sigma/\mu$	Average Monthly Exposure	Full Credibility*
2011	2.51	11.1	26,865	2.02	11.3	17,713
2010	2.45	11.1	25,596	1.86	11.3	15,018
2009	2.45	11.1	25,596	1.75	11.3	13,294
2008	2.33	11.1	23,150	1.68	11.2	12,144
2007	2.30	11.1	22,557	1.58	11.2	10,741

\* Full Credibility in Member Months = Average Monthly Exposure  $\times \left( \frac{1.96 \times \sigma}{0.1 \times \mu} \right)^2$

The results for MA in consideration of the existing guideline do not demonstrate enough support to change the existing guideline for full credibility. OACT proposes to maintain the full credibility guideline for MA BPTs at 24,000 base period member months.

The results for Part D indicate a significant and constant increase in the full credibility limit. This outcome is driven by consistently greater increases in  $\sigma$  (at a rate of 8% to 12% annually) as compared to increases in  $\mu$  (at a rate of 1% to 4% annually). While increases may continue to occur, OACT expects that the ratio,  $\sigma/\mu$ , will stabilize for Part D claims. In order to minimize the risk of overestimating the full credibility guideline for Part D BPTs and to minimize the degree of change from the existing guideline, OACT proposes using a full credibility guideline approximately equal to the maximum value during the experience period, specifically 18,000 base period member months.