The Algebra Symposium: Medicare Drug Benefit

Information on the Medicare Prescription Drug Benefit can be found at

`http://www.kff.org/medicare/rxdrugdebate.cfm`.

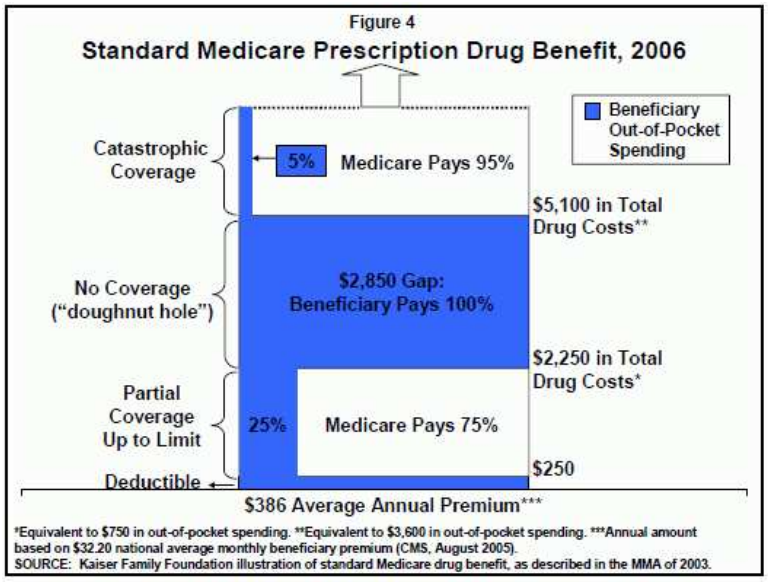
Much of the descriptive text in this discussion is taken verbatim from this Kaiser Family Foundation web site.

The Part D Prescription Drug Benefit

Under the standard benefit, beneficiaries in 2006:

- Pay an estimated $35 per month premium ($420 annual premium);
- Pay the first $250 in drug costs (deductible);
- Pay 25% of total drug costs between $250 and $2,250;
- Pay 100% of drug costs between $2,250 and $5,100 in total drug costs (the $2,850 gap or hole in the doughnut), equivalent to $3,600 out-of-pocket;
- Pay the greater of $2 for generics, $5 for brand drugs, or 5% coinsurance after reaching the $3,600 out-of-pocket limit ($5,100 catastrophic threshold).

From Kaiser, here is the *graphical representation* for *out–of–pocket* expenditures:



Mathematical Investigations

We shall investigate the relations between

- Annual drug costs
- Beneficiary Out of Pocket Costs
- Beneficiary Out of Pocket Costs Under the New Benefit
- Beneficiary Costs Including Estimated Average Premium of $420 Per Year
- Share of Drug Expenses Paid Out of Pocket by Beneficiary Under the New Benefit (Not Including Premium)
- Share of Drug Expenses Paid Out of Pocket by Beneficiary Under the New Benefit (Including Premium)

We introduce the variables

$$
\begin{aligned}
D &= \text{Annual Drug Costs,} \\
B &= \text{Beneficiary Costs Not Including Premium,} \\
P &= \text{Beneficiary Costs Including Premium of \$420 Per Year} \\
C &= \text{Share Paid by Beneficiary (Not Including Premium),} \\
S &= \text{Share Paid by Beneficiary (Including Premium).}
\end{aligned}
$$

1. Make a table of B, Beneficiary Costs Including Premium, and S, Share Paid by Beneficiary (Including Premium), versus D, Annual Drug Costs, when $D = 0, 250, 2250, 5100, 10000$.
2. Estimate B when $D = 125, 1250, 3675, 7500$. Estimate S when $D = 125, 1250, 3675, 7500$.
3. Plot the data (D, B) that you have found.
4. For what value of D does $D = B$? For what values of D is $D \geq B$? For what values of D is $D \leq B$?
5. Draw a graph of B vs D, $0 \leq D \leq 10000$.
6. Plot the data (S, B) that you have found.
7. Between 2000 and 2003, average annual total drug spending per beneficiary increased from $1,610 to $2,322, and is projected to increase to $3,160 in 2006. For the average beneficiary in 2006, estimate B, the Beneficiary Costs (Including Premium).

Resources

1. The Medicare Prescription Drug Law Fact Sheet

   `http://www.kff.org/medicare/7044.cfm`

   This fact sheet, describing the new Medicare Prescription Drug, Improvement, and Modernization Act of 2003, explores the new drug benefit, as well as additional changes to the Medicare program

2. Medicare and Prescription Drug Spending Chartpack

   `http://www.kff.org/medicare/6087-index.cfm`

   This chartpack provides 2003 and 2006 estimates of total and out-of-pocket prescription drug spending by Medicare beneficiaries. The data and analysis for this chartpack, prepared by Actuarial Research Corporation, assume no change in current law.