

The Math behind the Health Care Planning Tool  
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The purpose of this paper is to explain the math behind the formulas in the Health Care Planning Tool. The tool assumes that a congregation fixes the total compensation package for a rostered leader (RL); the RL then uses the tool to determine the best of the four health care plans for his/her family situation.

I. Estimating Health Care Usage

The tool compares the four health care plans by estimating the amount of health care the RL will use in 2014. To do this, let us assume that the RL was on Portico's health plan over the last 12 months. Portico's plan in 2013 was an 85/15 plan, with a deductible and out-of-pocket maximum based on an RL's family situation. Let

$\Delta$  := the RL's deductible for 2013 (\$1,000 for RL only; \$1,500 for RL and children; \$2,000 for RL, spouse, and children)

$C$  := total cost of health care incurred by the RL in the past 12 months (this can easily be estimated using Quicken or other personal-finance software)

$U$  := estimate of health care usage for 2014.

$U^*$  := estimate of health care used in the last 12 months.

If we assume that the RL's usage of health care remains fairly steady over time, then the amount of health care used in the last 12 months would be a reasonable estimate for the amount the RL will use in 2014, i.e.  $U = U^*$ . We have two cases: if  $C \leq \Delta$ , then the RL never reached his/her deductible level, and a reasonable estimate for  $U^*$  is  $U^* = C$ . On the other hand, if  $C > \Delta$ , then since the RL paid 15% of costs after deductible under Portico's previous plan, we can estimate the RL's health care costs over the last 12 months by the equation

$$C = \Delta + 0.15(U^* - \Delta).$$

Rearranging terms, we have

$$U^* = \Delta + \frac{(C - \Delta)}{0.15}.$$

Combining this with the above discussion, we conclude a reasonable estimate for the RL's health care usage in 2014 is

$$U = \begin{cases} C, & \text{if } C \leq \Delta \\ \Delta + \frac{(C - \Delta)}{0.15}, & \text{otherwise.} \end{cases}$$

Two caveats are in order: first, this is only an estimate. I encourage people to enter a range of values for  $C$  in the health care planning tool to see which plan is best for different amounts of health care usage. Second, this estimate does not take prescription costs into account. Portico has changed the prescription benefit for Silver+ and Bronze+ plans, requiring members to pay full costs until they reach their deductibles. I hope to include prescription costs in a future iteration of the spreadsheet; I am open to ideas for how to do this!

## II. Estimating Total Costs for Pastors Not Living in Parsonages and Other RL's

Interestingly, the math for pastors *not* living in a parsonage and the math for other RL's (diaconal ministers, deaconesses, and associates in ministry) is exactly the same. Since this is the simpler of the two cases, we'll address this one first. Let

$T$  := the total compensation package for the RL, minus any professional expenses paid to the RL  
 $D$  := defined compensation, including salary, housing, Social Security allowance (for pastors), and money the RL puts into an HSA or FSA

$HC_{\%}$  := potential health care premiums as a percentage of defined compensation

$HC$  := health care premium to be paid by the congregation

*Note:*  $HC = HC_{\%}D$  unless it exceeds either a maximum or minimum threshold; the Tool determines the appropriate amount to use.

$F$  := amount the congregation supplies towards an FSA

*Note:* When we calculate for Gold+ and Platinum+ plans, we assume  $F = 0$ .

$p$  := percentage of defined compensation used to pay the RL's pension

$h$  := percentage of defined compensation used to determine  $HC_{\%}$

$d$  := percentage of defined compensation used to determine other benefits (disability, etc.).

Then it is easy to see that

$$T = D + HC + F + pD + dD. \quad (1)$$

Further, if  $HC = HC_{\%}D$ , then since  $HC_{\%} = hD$ ,

$$T = F + (1 + h + p + d)D.$$

Rearranging terms yields

$$D = \frac{T - F}{1 + h + p + d}.$$

It follows that

$$HC_{\%} = hD = \frac{h(T - F)}{1 + h + p + d}$$

This formula is used to determine  $HC_{\%}$ . We then check the minimum and maximum thresholds to determine the actual amount  $HC$  for the congregation. It follows from (1) that

$$D = \frac{T - HC - F}{1 + p + d}$$

This is the formula used for Defined Compensation in the PastorNoParsonage spreadsheet, and for Salary in the OtherRosteredLeader spreadsheet. The amounts for pension ( $= pD$ ) and other benefits ( $= dD$ ) follow immediately.

### III. Estimating Total Costs for Pastors Living in Parsonages

The math for a pastor living in a parsonage is a bit more involved than the math in Section II, because not all of the defined compensation is paid as salary – the pastor’s housing is provided free of charge, yet we must include it when determining  $D$ .

In addition to the variables above, let

$S$  := salary paid to the pastor

$e$  := percentage of pastor’s salary and (implied) housing paid as Social Security allowance  
(normally 7.65%, though this benefit is optional for the congregation)

$H$  := implied housing cost, not paid to the pastor

$E$  := amount paid to the pastor as Social Security allowance

The housing allowance is implied to be 30% of salary, so  $H = 0.3S$ . It follows that

$$E = e(S + H) = 1.3eS, \quad (2)$$

so

$$D = S + H + E = 1.3(1 + e)S. \quad (3)$$

Since  $H$  does not factor into the total compensation actually paid to the pastor, we have

$$T = S + E + pD + HC + F + dD = HC + F + (1 + 1.3e)S + (p + d)D. \quad (4)$$

If  $HC = HC_{\%}$ , it follows that

$$\begin{aligned} T &= F + (1 + 1.3e)S + (p + h + d)D = F + (1 + 1.3e)S + 1.3(1 + e)(p + h + d)S \\ &= F + \{1 + 1.3[e + (1 + e)(p + h + d)]\}S. \end{aligned}$$

Rearranging terms, we get

$$S = \frac{T - F}{1 + 1.3[e + (1 + e)(p + h + d)]}$$

Then

$$HC_{\%} = hD = 1.3(1 + e)hS = \frac{1.3(1 + e)h(T - F)}{1 + 1.3[e + (1 + e)(p + h + d)]}$$

We use this formula to determine  $HC_{\%}$ . We then check the minimum and maximum thresholds to determine the actual amount  $HC$  for the congregation. It follows from (4) that

$$\begin{aligned} T &= HC + F + (1 + 1.3e)S + (p + d)D = HC + F + (1 + 1.3e)S + 1.3(1 + e)(p + d)S \\ &= HC + F + \{1 + 1.3[e + (1 + e)(p + d)]\}S, \end{aligned}$$

and rearranging terms yields

$$S = \frac{T - HC - F}{1 + 1.3[e + (1 + e)(p + d)]}$$

This is the formula used for Salary in the PastorParsonage spreadsheet. The amount for  $E$  follows from (2), and pension ( $= pD$ ) and other benefits ( $= dD$ ) follow from (3).