

The Calculation Guide

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Equations	Page	Output	Explanation	Notes/Significance
1	High-Need, High-Cost Population	Calculation of baseline PMPM cost	Baseline means the expense for each medical event that would be anticipated if social services were not offered. The calculation is made by multiplying the annual incidence of each specific medical event by its unit cost and then converting the result to a per member per month (PMPM) basis. For hospital admissions and readmission and for skilled nursing facility admissions, the unit cost is the product of the daily cost and the number of days for that admission (length of stay). The total cost represents the anticipated PMPM spending across all the selected medical events.	The higher the baseline cost, the greater the potential for social services to be of value in terms of reducing medical costs.
2	Population: Possible Social Services	Number of HNHC members	The absolute number of individuals receiving each service. It is the product of the total number of eligible members in the HNHC population multiplied by the proportion of that population that is chosen to receive that specific service.	The larger the number of members receiving services, the higher the overall costs of providing social services. But it's likely the overall impact on cost avoidance would be greater since more people are served.
2	Population: Possible Social Services	Total service volume per month - all recipients	Total service volume of each service when expressed on a monthly basis is the product of the number of HNHC recipients of the service multiplied by the number of service units received per month. The number of units provided monthly is known as the "service intensity." Home modifications is a category treated differently from the other supports because it is a binary intervention: it is either provided to a recipient or not. The calculator automatically converts this, as it does all inputs, into the common PMPM measure. The calculator accomplishes this by apportioning one-twelfth of each home modification to each month of the year.	This calculation is needed to assess the overall costs of each service.
3	Service Costs	Cost per month per recipient	The per recipient per month cost of the provision of each service is found by multiplying the monthly service intensity (units of the social service provided monthly to each person) by the average cost of the unit of that social service. The average cost of a unit is found by adding the variable cost per unit to its average fixed cost. Average fixed cost is computed by taking the annual fixed expense (cost irrespective of volume) and dividing it by the annual volume of the service provided. The calculator allows for fixed costs to be considered for both the clinical partner and the social service entity.	If fixed costs were assumed, then the cost per recipient per month would be lower - meaning scale economies would result.
3	Service Costs	Cost per month per beneficiary	Cost per beneficiary per month of providing a social service. There are generally more beneficiaries than there are recipients of any service since not all beneficiaries will require each service. This cost is derived by multiplying the PMPM cost per recipient by the ratio of recipients to the total number of beneficiaries.	If all beneficiaries receive the service, then the cost per recipient and per member are the same.

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4	Impact on Utilization	Cost avoidance PMPM	Cost avoidance PMPM is the savings resulting from offering the entire array of social services, in the volumes specified, to all the members designated to receive them. Cost avoidance is measured as the difference between expected medical expenses after the social services are added and the baseline level expenses. This difference is a function of the assumed changes in the utilization of each medical event that the user has selected.	This is a crucial number as it represents a key component of the gross benefits from the partnership. The other component is revenue generation.
4	Impact on Utilization	Percent reduction	Cost avoidance, or the anticipated change in medical costs, can be also expressed as a percentage of its baseline overall cost.	This is a measure of how effective the social service offerings are in reducing medical costs.
5	Medical Partner Revenue Implications	Total additional revenues	The calculator gives two options for sources through which enhanced revenues may be received by the medical sector partner. The first would be a payment received on a PMPM basis. An example of this might be a health system receiving a fee from the Centers for Medicare and Medicaid Services for chronic disease management. A second source is an annual lump sum. Examples are an annual bonus, a lesser penalty for hospital readmissions, or a shared savings payment.	
5	Medical Partner Revenue Implications	Reduction in the number of admissions (%)	The calculator recognizes that addressing social service needs may reduce hospital admissions. A reduction in admissions can have a negative effect on revenues to a hospital if it is paid under a fee-for-service system. The tool's algorithm for calculating the ROI incorporates this possibility. The reduction in the number of admissions is the percentage reduction due to addressing the social determinants of health relative to the baseline number of such admissions.	If a provider were at full financial risk for hospital admissions, the reduction in these events would have no negative revenue implications.
5	Medical Partner Revenue Implications	Revenue Increases	The calculator summarizes the receipt of both monthly and annual revenues on a PMPM basis.	
5	Medical Partner Revenue Implications	Revenue decreases	Reduction in revenues from lower hospital admissions occurs under a fee-for-service system, where each admission averted means not only a reduced cost, but also a revenue loss.	
5	Medical Partner Revenue Implications	Net revenue change	The result of considering both possible revenue enhancements and reductions.	
6	(PMPM) Summary of Financial Returns	Total reduction in medical costs to the medical partner	The sum of the cost differences in each area where medical utilization has changed. Note that unlike all other areas, the slider bar for primary care allows the user to choose an elevated utilization level. If primary care rises as a result of offering social services, then you will see a negative number for primary care medical cost reduction in the corresponding row.	

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6	(PMPM) Summary of Financial Returns	Change in revenues to the health partner	The net revenue change to the medical partner that was reported on the prior page.	The larger the (positive) revenue change, the higher the ROI.
6	(PMPM) Summary of Financial Returns	Gross financial benefits	This is the sum of the cost avoidance and the revenue enhancement from offering social services before any costs of delivering such services are counted.	
6	(PMPM) Summary of Financial Returns	Costs to the CBO of social services	This is the aggregate expense incurred by the community-base organization (CBO) to deliver the portfolio of social services in the amounts assumed.	
6	(PMPM) Summary of Financial Returns	Costs to the health sector partner of contracting for social services	Any fixed costs incurred directly by the medical partner related to integrating social services with its medical services (distinct from payments made to the CBO partner).	Before the ROI for the medical partner is calculated, any of its own expenses for providing social services must be considered.
6	(PMPM) Summary of Financial Returns	Net benefit of integrating social services	This is gross benefits of addressing the social determinants minus the sum of the costs to the two partners.	
7	Payment Systems	Markup percentages	The units to be priced are the service, the case, and the beneficiary for the respective payment systems: fee-for service, case rate, and capitation. The price per unit is selected as a percentage markup over the expected cost of each unit. For example, if the expected cost of a unit of service were \$100, and the markup chosen were 10%, the price per unit service used in subsequent calculations would be \$110.	The markup percentages for the various payment systems do not need to be identical. For example, under a capitated system, the CBO assumes more financial risk; this may be balanced by a higher markup percentage.
7	Payment Systems	Gain sharing percentage	This gain share accruing to the CBO under a gain-sharing system is expressed as a percentage of the overall net benefits resulting from the provision of the array of social services.	The tool adds gain share proceeds to the payments made to the CBO to reimburse its costs in order to calculate the CBO's total income from the partnership.
7	Payment Systems	Enhance effectiveness under gain sharing	The measure of enhancement effectiveness is the selected added percentage of the net benefits. If the user selects, say, 5%, the net benefits that were previously calculated are increased by 5%.	This option reflects the possibility that social services are delivered more effectively under gain sharing because of the alignment of incentives.
8	Results: Payment System Comparison	Clinical partner PMPM Net Income	The clinical partner's PMPM net income is calculated for each payment system. It is the difference between their gross benefits and the sum of the clinical partner's own costs plus the payments it makes to the CBO.	

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8	Results: Payment System Comparison	Clinical partner ROI	The ROI is found by dividing the clinical partner's net benefits by its overall costs. Overall costs are the sum of its own costs plus the payments made to the CBO.	The ROI will be expressed as a percentage.
8	Results: Payment System Comparison	CBO net income	The CBO's net income, expressed on a PMPM basis, is equal to the total revenues the CBO received from the clinical partner minus its own costs.	The CBO and the medical partner can both enjoy a positive net income.
9	Optional Tool: Discovering Effectiveness Levels	Utilization reduction required to achieve the desired ROI	The algorithm used to achieve this requisite reduction starts with an ROI result for the medical partner and then works backward by calculating the utilization change that would bring about that result. The user enters an ROI as the goal, and the calculator will compute the requisite utilization reductions in three domains that would achieve that target. The results are displayed for all payment systems that have been selected. Each required reduction for the three domains is calculated holding all other reductions and all other independent variables at their previous levels.	This algorithm is a generalization of traditional breakeven analysis. For example, if the ROI goal were set at 0%, the computed utilization change is that number which results in zero net benefits (or breakeven).
10	Optional Tool: Allowing for Uncertainty	Lowest estimate	The lowest value of the variable in the triangular probability distribution that is used in the simulation. The user chooses the spread or range between the lowest and highest values anticipated when uncertainty exists. For example, if the user chose a range of between +10% and - 10% of the value that had been inserted into the calculator, the lowest value that would be automatically inserted in this column would be 90% of that number.	
10	Optional Tool: Allowing for Uncertainty	Highest estimate	The highest value of the variable in the triangular probability distribution that is used in the simulation. The user chooses the spread or range between the lowest and highest values anticipated when uncertainty exists. For example, if the user chose a range of between +10% and - 10% of the value that had been inserted into the calculator, the highest value that would be automatically inserted in this column would be 110% of that number.	This is the best possible result or output that can occur when all variables in the simulation assume the most optimistic levels.
10	Optional Tool: Allowing for Uncertainty	Mean estimate	The value of the variable that the user placed into the calculator previously. It is the "best" estimate of its magnitude.	
11	Results from Uncertainty Simulation	Current value	The previously reported outcome based on the values of the independent variables that were inserted.	This is the value when no risk and no uncertainty exists.
11	Results from Uncertainty Simulation	Minimum value	The lowest end of the distribution or range from the simulation output. The simulation systematically recognizes the inherent uncertainty surrounding the true values of the key variables in the model. The simulation runs 1,000 trials and the result of each separate calculation becomes a point on the distribution. Whereas prior results were predicated on the best estimates that the user had inserted, here a range or distribution of results is displayed, instead.	This is the lowest number or output of all 1,000 observations that result when all variables in the simulation are exposed to variability

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11	Results from Uncertainty Simulation	Maximum value	The highest point of the distribution or range that stems from the simulation that systematically recognizes the inherent uncertainty surrounding the true values of the key variables in the model.	This is the highest number or output of all 1,000 observations that result when all variables in the simulation are exposed to variability
11	Results from Uncertainty Simulation	Average value	The geometric mean of the distribution that results from the 1,000 trials.	The current value and the mean value should be very close. However, the values will differ if the chosen spread is not symmetric. In that event, the probability distribution is not normal, but instead will be skewed.
11	Results from Uncertainty Simulation	Standard deviation	A measure used to quantify the amount of variation or dispersion of the set of income values reported from the simulation.	The greater the standard deviation, the larger the variability and therefore the greater is the risk of the net income received.
11	Results from Uncertainty Simulation	Span between minimum and maximum values	The difference between the highest and the lowest values taken from the simulation-driven distribution of net income.	
11	Results from Uncertainty Simulation	Probability of loss	Based on the probability distribution from the simulation, the tool reports the percentage of observations of net income results that are below zero.	This is the percentage of the 1,000 results that represent a financial loss. If this percentage is zero, it means that despite uncertainty, there is no statistical risk that a loss will be suffered.
11	Results from Uncertainty Simulation	Percent below	The user can stipulate a specific net income and the calculator reports the percentage of data points from the simulation distribution that lie beneath that level.	This is the percentage of the 1,000 results that is beneath a selected threshold.