MILLIMAN CLIENT REPORT

# Independent review of Summus Global's client savings estimation methodology

## Commissioned by Summus Global, Inc.

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# I. Executive Summary

Summus Global, Inc. (Summus) engaged Milliman to evaluate its methodology for analyzing client savings related to usage of Summus's virtual specialty care platform. To support Milliman's review, Summus provided descriptions of its online platform for patient engagement and overviews of its operating model, as well as interventions that drive savings, the savings calculation methodology, and detailed data for six case studies from its primary data source (Monocle Insights). This report describes Summus's services (Section II) and its savings methodologies and data sources (Sections III), discusses some limitations of the savings approaches used by Summus (Section IV), and outlines important caveats and limitations of our review (Section V).

This report is intended to provide feedback on the actuarial appropriateness of Summus's methodologies for analyzing client savings as they were presented to us. This report may not be appropriate outside of this specific context and should not be used for any other purpose. Actual experience will differ from historical experience and the results for any specific employer or other type of client will be unique to the characteristics of that employer or client and other external factors not considered in this assessment. We are only commenting on the general approaches provided to us by Summus for calculating the estimated savings attributable to the Summus virtual specialty care platform and program. We are not commenting on results of any particular client that engaged Summus to provide its services. This information does not constitute an endorsement or recommendation of Summus's services, nor does it quantify the value of Summus's services in aggregate or for any specific group, historically or in the future.

In summary, Summus's methodology consists of two parts, which are distinct and mutually exclusive:

- The first part captures the potential cost savings from a changed diagnosis, a changed care path, or both. This part of the methodology relies on acquiring credible data sets that capture the demographic characteristics of the patient and the cost of:

  a. The original diagnosis and/or care path (the control group).

  b. The changed diagnosis and/or care path (the treatment group).

  The adjusted allowed cost difference in these two data sets is the implied savings for a given patient case that has adopted the alternative treatment path resulting from the Summus intervention.

- The second part captures potentially avoided costs of office visits, specialist referrals, urgent care, and emergency department visits as a result of using the Summus specialty care platform and engaging with Summus medical staff for consultations.

Based on our review of materials provided by Summus regarding this two-part methodology, we conclude that:

- The methodology for estimating the financial impact of Summus interventions as presented is reasonable from an actuarial perspective. Summus's estimated savings calculation approach aligns closely with its business model, the services provided, and the main program features that Summus claims drive employer savings.
- The estimating methodology is consistent with typical actuarial practices to estimate the net financial impact of a program of this nature. We believe the estimating methodology is reasonable in terms of approach, data employed, and assumptions made.
- The estimating methodology may produce estimates that materially understate or overstate savings for any individual patient case, and possibly for any specific healthcare payer client, such as a health plan or employer group whose total savings are aggregated across a cohort of members utilizing Summus's services.

  Misstatement of savings is more likely to occur when either, or both, of the treatment or control cohorts mentioned above are small. Even though Summus deals with a wide variety of patient cases of varying complexity, the variability in savings results determined by the method is primarily, but not exclusively, driven by the relatively low number of complex patient cases available for use in constructing control and treatment groups from the Monocle Insights[1] database. We recommend minimum sample sizes depending on the nature of the case being evaluated

[1] See main report for additional information on Monocle Insights.

to reduce the likelihood of over- or understatement of savings, as well as the use of explicit margins to minimize the likelihood of savings being overstated.

- Savings could be overstated when a Summus member does not actually adopt the treatment path that the methodology assumes is producing savings. Although Summus has a process in place and self-reported data to indicate that the actual treatment path assumed to generate savings was taken, we recommend the use of actual downstream medical and pharmacy claims data to examine actual outcomes, compare to outcomes as recorded by the self-reported data and calculate an adjustment factor to true up calculated savings with actual downstream claim experience.

Any reader of this report must possess a certain level of expertise in areas relevant to this analysis to appreciate the significance of the assumptions and the impact of these assumptions on results. Milliman recommends that third parties be aided by their own actuaries or other qualified professionals when reviewing this report.

We are members of the American Academy of Actuaries, and we meet the qualification standards for performing the analyses in this report.

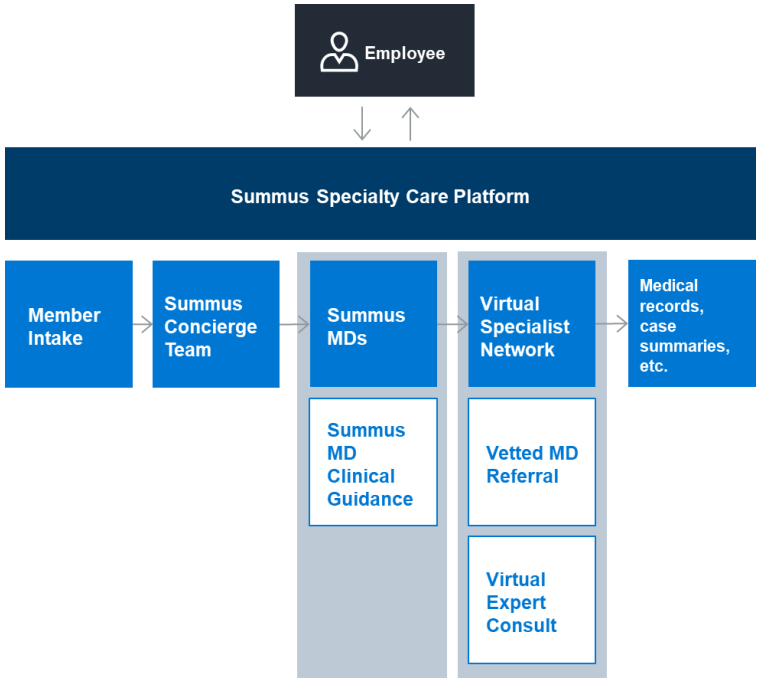
This analysis is subject to the terms and conditions of the Consulting Services Agreement between Summus and Milliman dated August 1, 2022. We understand that Summus intends to provide public access to this report through an internet link and, therefore, it could be viewed by its prospective customers, competitors, potential investors, or other interested parties. We consent to this distribution if the work is distributed in its entirety. Milliman does not intend to benefit and assumes no duty or liability to other parties that review this work or rely on it.

# II. Background

This section provides an overview of the Summus operating model as presented to Milliman by Summus management.

Summus is a virtual specialty care platform that provides employees[2] of its employer clients (hereafter referred to as Summus members or just members) with a range of services including health journey navigation, preventive and ongoing health consultations, and expert medical advice for complex conditions and procedures. Depending on condition, the level of severity, and emergent need, a member could follow various paths after the initial contact and consultation with a Summus physician. Figure 1 illustrates the Summus offering and how it engages members and delivers services through its platform, followed by Summus's description of its service model.

**FIGURE 1: SUMMUS OFFERING**




- **Summus Specialty Care Platform.** Summus members use the platform as the single point of entry for all Summus services. This platform serves as the ongoing interaction medium for the duration of any engagement.
- **Member intake.** Members may access the Summus platform for a variety of reasons across a broad spectrum of condition severity or healthcare need, ranging from preventive and well-being care to chronic and complex condition management. Case information, medical history, and other information (e.g., digitized medical records) are collected by the Summus Concierge Team (see below).
- **Summus Concierge Team.** This team is comprised of clinically trained member experience professionals who assist Summus members with intake, accessing Summus MDs and the Summus network of specialists, as well as making recommendations for in-person care.

[2] "Employees" is used for brevity throughout, but the dependents of employees are also eligible.

- **Summus MDs.** Medical doctors contracted with Summus who provide clinical guidance to members and remain engaged with members throughout their care journeys.
- **Virtual specialist network.** This is a nationwide network of specialists contracted for expert consultations across the spectrum and complexity of conditions. Summus works with the employer's health plan and, therefore, members could also be referred to Summus-vetted specialists for in-network and local (non-virtual) care delivery.
- **Medical record collection, case summary storage, and curation.** Medical records specialists, in conjunction with the clinical team, collate the appropriate medical records and imaging from outside sources needed for Summus MD and specialist consultations. Additional medical records, imaging, and information can be stored on the platform for member use and communication purposes.

As the company engages with a wide variety of member conditions and health needs, Summus believes its model could result in employer healthcare cost savings in multiple ways. The Summus estimating methodology calculates potential client savings on the higher-impact aspects of its offerings. These aspects include:

- **Changed treatment path (excluding avoided surgeries).** Members may be advised by a Summus MD or an expert specialist to discuss an alternative care path with their care provider(s) for a particular condition or health need. This potential change in treatment path may or may not be the result of a changed diagnosis but will be typically less invasive and less expensive. A conversation with a Summus MD or expert from the virtual specialist network could lead to a change in diagnosis, a change in the path of care, or both.
- **Avoided surgery.** Similar to a change in treatment path noted above, avoided surgeries are specific to paths that are alternatives to surgeries. They might include therapy, additional diagnosing or imaging, or less invasive procedures.
- **Avoided office visits.** Summus MDs assist members by reviewing medical records and providing diagnosis and treatment information for members to take back to their providers for discussion. In addition, they provide prepared questions for a member to ask their care providers to help them make optimal decisions about what treatment protocol to pursue. This process may improve the efficiency and effectiveness of a provider visit, leading to faster resolution of next steps and fewer office visits altogether.

  Summus also provides navigation for patients needing local specialist care, directing them to the appropriate, specialist provider, thereby avoiding multiple visits to potentially inappropriate specialists in the absence of Summus.
- **Avoided ER and urgent care visits.** Because of Summus's short response time to inquiries, members may avoid expensive and unnecessary visits to emergency departments (ERs) and urgent care centers.

At the time of this report, Summus does not have access to downstream claim data for the employer client or the employee. Therefore, Summus tracks the actual care path of the member (i.e., whether or not the member actually avoided a surgery, implemented the alternative care path, avoided an emergency department visit, etc.), through the Specialty Care Platform. After the episode of care in question, information is solicited from Summus members and consulting physicians to identify changed care paths and avoided services.

# III. Overview of savings methodology

Summus uses a two-part methodology to impute the savings for any given engaged Summus member, with each part aligning with its operational model that could drive the savings noted in *II. Background*. Changes in treatment paths and avoided surgeries use the same sub-methodology. Direct cost avoidance associated with office visits, emergency departments, and urgent care centers use a second sub-methodology.

The estimated savings for all encounters for all members who engage with Summus are calculated for a benefit year before Summus fees are then subtracted. The entire methodology, including both sub-methodologies, is illustrated in Figure 2, where *n* is the number of members that engage with Summus at least once and *k* is the number of encounters member *n* had.

**FIGURE 2: SUMMUS METHODOLOGY**

$$\sum_{1}^{n}\sum_{1}^{k} Gross\ Savings\ from\ Changed\ Care\ Path/Avoided\ Surgery_{n,k}$$
$$+$$
$$\sum_{1}^{n}\sum_{1}^{k} Gross\ Savings\ from\ Avoided\ OV/ER/UC_{n,k}$$
$$-$$
$$\sum_{1}^{n} Summus\ PMPM\ Fees \times 12$$
$$=$$
$$Total\ Employer\ Net\ Savings$$

### CHANGED TREATMENT PATH AND AVOIDED SURGERY

Summus member interactions can result in a change in diagnosis, a change in treatment path (including avoided surgeries), or both.

#### Overview

Summus uses a database sourced from Monocle Insights (see additional comments under "Data Quality" below) to pull medical and prescription drug allowed[3] claim information for two cohorts: one that is representative of the costs related to the original diagnosis and procedure and a second cohort that represents the revised, Summus-recommended procedure and/or diagnosis. They are referred to as the control and the treatment cohorts, respectively. This data is summarized for a 45-day period, anchored at the date of the procedure. The 45-day duration begins 15 days prior to the procedure and ends 30 days afterward. All costs are captured during this episode of care. The claim data used is as specific as possible (see "Step-Wise Query Criteria" discussion below) to the member's age, sex, geographical region (initially state), ICD-10 diagnosis code, and Current Procedural Terminology (CPT) or Healthcare Procedure Code (HCPC) designation. The difference in the median values of these two cohorts is taken to be the savings for the individual Summus member under evaluation, as illustrated in Figure 3.

[3] Allowed amounts are the total amount paid to the provider for a service. It includes the member's cost sharing and the amount paid by a third-party payer or insurer.

FIGURE 3: CALCULATION OF SAVINGS


The above calculation of gross savings (prior to subtracting any Summus fees charged to the employer) is done for all members and for all Summus encounters for each member (as they may have more than one avoided surgery or changed care path).

### Step-wise query criteria

To measure savings in this manner (using actual claim data), it is important to obtain enough data such that both control and treatment cohorts reasonably represent what might have happened with both services received and the cost of those services, in the absence of a particular treatment, and what happens under a changed treatment path (control and treatment, respectively). Because the typical member case for Summus is often complex and potentially unique, the returned data set could be too small if the criteria are very specific. This introduces a challenge when constructing a control (or treatment) group from the Monocle Insights data.

To address this challenge and improve the credibility of the cohorts, Summus uses a step-wise approach that gradually widens the criteria for pulling claim information related to a member's condition and treatment path until the data set returned is of sufficient size to credibly calculate savings. This gradual widening is intended to minimize any loss of specificity to the case at hand. This progression is detailed below:

- Use 10-year age bucket, specific sex, state, full ICD-10 code, and CPT code of the case being evaluated.
- If the subsequent output population is less than 1,000, use the short diagnosis code (first three digits of ICD-10) instead of the full ICD-10 code.
- If the subsequent output population is less than 100, expand the age bucket by 10 years until a population size greater than 100 is obtained.
- If the subsequent output population is less than 100, use all ages.
- If the subsequent output population is less than 100, expand to use both sexes.
- If the subsequent output is still less than 100, no diagnosis criteria is used. This is only done when the CPT is very specific to the ICD-10.

The above progression is based on a recommended sample size in both treatment and control of 1,000 cases and a minimum of 100. See "Considerations" section for more discussion of these ranges.

### Data quality

In constructing the cohorts described above, Summus uses data queried from a database built by Monocle Insights. Monocle Insights is a healthcare data aggregator and analytics company. Among other services, it provides data on "patient journeys." A patient journey is defined as a single patient across the duration of time that they are contained within the database. The data contains more than 340 million unique patient journeys. The data also provides subsegments of the overall journey that are specific to an episode of related care involving specific diagnosis and/or CPTs. The patient data is collected from various sources that, when combined, cover the Medicare and Medicaid markets for all 50 states and a material portion of the commercial large group employer and the Patient Protection and Affordable Care Act (ACA) individual and small group markets. The database covers calendar years 2016 and forward,

although Summus queries only 2018 and forward. Querying capabilities are robust in that subsegments of a patient journey specific to the CPT and diagnosis of a Summus member can be acquired, subject to the step-wise approach outlined above.

### Data adjustments

Once the data for both cohorts is returned, it is examined for reasonableness and outliers. Observations that lie above three standard deviations from the mean are removed. Please note that the removal of outliers has a smaller effect on the resulting claims used for the calculation of savings due to use of the *median* claims rather than the *mean* claims when calculating savings. See additional discussion on the use of the median in the "Considerations" section below.

## OFFICE VISIT, EMERGENCY DEPARTMENT, AND URGENT CARE COST AVOIDANCE

Summus believes its members can avoid additional or unnecessary utilization that would otherwise generate medical claims at various sites of care. The following are the care settings in which this utilization could be avoided:

- **Urgent care and emergency department visits.** Avoidance of these types of encounters could arise from the response time and availability of Summus medical professionals, including the Concierge team and Summus MDs. Member engagements with Summus MDs could count as an avoided emergency department or urgent care visit, depending on the type of interaction, as well as the member and Summus MD feedback collected through the platform.
- **Primary care office visits.** Interactions between Summus members and Summus MDs or the expert medical network do not generate medical claims. Therefore, each interaction a member has with a Summus MD for clinical guidance or navigation could be counted as an avoided primary care physician (PCP) visit or an initial specialist visit.
- **Expert consultation.** An expert medical opinion (EMO) involves an intake conversation with a Summus MD for appropriateness of consultation and preparation of the consultation with the expert, including curating records, writing a specialist summary, and developing questions for the patient and expert to use to maximize the interaction with the actual provider. Each Summus EMO, therefore, could replace two physician consultations, one of equivalent value to primary care and one to that of the specialty pertinent to the case.

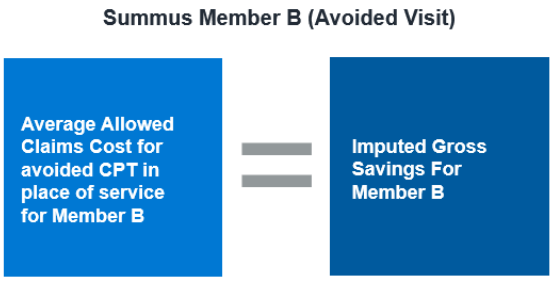
### Overview

Summus uses information collected from the Specialty Care Platform to inform whether or not a service was actually avoided, and the type of service avoided (i.e., ER visit, urgent care visit, primary care visit, etc.), when a member engages with a Summus MD, Concierge team member, or expert consultant.

A visit is counted as avoided when a Summus MD or specialist indicates this affirmatively in the Specialty Care Platform for a particular case.

Data summarized from the Monocle Insights database is then used to inform the average allowed cost for each type of avoided visit within the relevant geographic area. This average allowed cost of the avoided visit from the Monocle Insights data is the gross savings for the avoided visit, as defined by CPT code and place of service. This is illustrated in Figure 4.

**FIGURE 4: CALCULATION OF GROSS SAVINGS**




The above calculation of gross savings (prior to subtracting any Summus fees charged to the employer) is done for all members and for all avoided visits for each member (as they may have more than one interaction with Summus that could result in avoided healthcare visits), as shown in Figure 2 above.

# IV. Considerations

Notwithstanding the overall conclusion that Summus's methodology is reasonable and actuarially appropriate, we have the following comments and considerations that the reader should bear in mind, in order of importance.

### VARIABILITY

Results produced by small sample sizes of the treatment and control groups for the savings calculation for avoided surgeries and changed treatment paths may contain a degree of variability that could have a material impact on the resulting gross savings (either to overstate it or understate it). We recommend the following considerations related to this potential variation:

- Generally, we recommend a minimum sample size of 100 patients for both the control and the treatment cohorts.
- In certain cases, less than 100 patients can be used based on the distribution of the sample results and clinical judgment. Claim distributions that are tighter (i.e., less variable) may be more appropriate candidates for a reduced sample size. Treatment paths that are simpler, less invasive, and less likely to result in downstream complications are also good candidates. Notwithstanding these types of cases, the sample size should never be below 25 patients. In these cases, we recommend not calculating savings for the case.
- For treatment paths with less complexity (e.g., follow-up MRIs and observation), where a clear mode[4] of the distribution of allowed cost exists, it may be appropriate to use the mode of the costs (i.e., the most frequently observed value in the data set), rather than the median as the best estimate.
- If no clear mode exists, then use of the median allowed cost to calculate savings is recommended. The median will, by its nature, control for outlier cases and reduce the possibility for over- or understatement of savings. The median is also typically more conservative than the mean, which can be heavily influenced by atypical, outlier cases.
- Truncate both the control and treatment data sets above three standard deviations of the mean allowed costs. This accounts for possible billing errors or other data quality issues, as well as for cases that are not representative of the case under evaluation.

Note that truncation of the data may result in changes to the median allowed cost, but the mode will remain unaffected. Summus should use judgment, based on clinical, analytic, and statistical in-house expertise, to appropriately apply the query criteria and the step-wise progression, as well as appropriate margins on resulting savings calculations.

### MARGIN

There is inevitable uncertainty in how accurately the control and treatment cohorts (and the associated mean and median allowed costs) represent the savings for a particular Summus member case under the different treatment paths. The use of the median value as the "best estimate" will typically yield a lower value for costs in both the treatment and the control cohorts and, as a result, yield a lower savings amount when taking the difference between the two. Even with this inherently conservative estimate, we recommend the use of explicit margins in the savings calculation to account for this uncertainty. Some cases may have a low degree of variation in these cohorts while others will have a higher degree of variation. Therefore, we specifically recommend:

- Generally, margins on savings estimates should be adjusted accordingly to account for higher variability in smaller sample sizes. In other words, margins should not necessarily be the same across all savings calculations and for all cases.

[4] The mode of a distribution is the value, in this case a range of claims, for which there is the greatest number of observations.

- Specifically, a percentage margin should be applied to the gross savings calculated, based on clinical judgment and an analytical review of the cost distributions for the measured case. Due to the variability in the complexity of cases, the same degree of margin may not be appropriate for every measured case. Cases with higher claim variability (as seen in the treatment or control cohort data sets) or cases that are clinically known to have the possibility of more downstream complications should have higher margins applied.
- In control and treatment cohorts with fewer than 100 patients, incorporate margins based on a percentile of allowed costs of the control cohort lower than the median (50th percentile) and on a percentile of allowed cost of the treatment cohort higher than the median.

### POTENTIAL BIASES

It is possible that either:

a) The Summus-recommended treatment path is not ultimately adopted by the member and/or the care-providing physician (more material)

b) The patient follows the Summus-recommended treatment path and later reverts to the originally recommended treatment path after the measured 45-day window used in calculating gross savings and outside of the employer's benefit period being used to calculate total employer savings (less material)

In either of these cases, the methodology outlined herein will overstate savings as these effects will not be captured. To correct for this upward bias in savings estimates, we recommend either of the following:

- To address a) above, perform an experience study using actual data aggregated from Summus clients to measure the frequency with which patients do not adopt the Summus-recommended treatment path. Apply this experience-based adjustment factor to the gross savings calculated.

  To address b), a study could be done to review Summus member engagements where ultimately both treatment paths were adopted, thereby increasing total costs. Both the frequency of this outcome and the excess cost would need to be measured to capture the total impact in the adjustment factor.

  Because the events in a) and b) are mutually exclusive, using the higher of the two estimates of savings reduction factors described above would capture the required effects with some margin for conservatism.

- When applying the savings methodology, only do so on patients who are known to have always followed the Summus-recommended treatment path. However, this only addresses the first bias noted above, albeit the more material of the two listed.

### METHODOLOGY'S RELIANCE ON INPUT DATA

Summus's methodology relies on data inputs to drive savings estimates. There are two important data sources, corresponding to two key aspects of the full methodology.

- The most significant portion of savings generated and measured by Summus for a particular case is based on the sub-methodology for avoided surgeries and changed treatment paths. This sub-methodology relies on the Monocle Insights data. Our limited review of this data found it to be robust in its volume and query capabilities. This data also appears suited to the Summus business model and method of savings calculation. However, Milliman has not audited this data or run detailed analyses to examine the data for broad-based reasonability or accuracy. Milliman did run similar, independent queries on Milliman's own proprietary databases for six specific cases, defined by Summus. While data structure, timing, and sources were different between the Milliman and Monocle Insights databases, our analysis showed similar mean and median costs.
- Being a new source of data for Summus, and because it is used to estimate a material portion of the savings from the overall methodology, we recommend that Summus examine data results thoroughly for each case being evaluated and expand its knowledge of the database to ensure proper and accurate queries are performed on the data for all cases.

- We also note that while the step-wise criteria is intended to optimize both sample size and sample specificity, it nonetheless involves trade-off between these two criteria. Unique or complex cases, by their nature, will have a greater chance of smaller sample sizes using the most specific criteria. Broadening the criteria will have varying effects by case.
- The sub-methodology for avoided office visits relies on self-reported data from the Specialty Care Platform. This data was not audited by Milliman for reasonableness or accuracy. Self-reported data may not, in all cases, be complete or accurate. We recommend a retrospective experience study to adjust the estimated savings to accurately reflect actual experience of engaged members versus the self-reported data.

## GEOGRAPHIC AND TREND ADJUSTMENTS

### Geographic adjustments

Average allowed charges can vary significantly based on geographic area, particularly in the commercial markets. There may be a high degree of variability within states (e.g., Albany versus Manhattan in the state of New York). Statewide data used in the calculation of gross savings is averaged at the encounter level for similar service types; however, the gross savings resulting from the methodology should be adjusted using geographic cost factors at the metropolitan statistical area (MSA) level to normalize for the potential difference in cost based on the geographic area in which the actual case being evaluated is located. For example, if a specific case is in Albany, New York, but the statewide data is more concentrated in New York City, the cost differential between control and treatment cohorts may be overstated due to the geographic cost differential between New York City and Albany. As a result, we recommend applying this adjustment at the end of the gross savings calculation. These factors can be derived from Monocle Insights data or purchased from outside firms.

### Trend adjustments

Medical and prescription drug trend has a material impact on the overall costs observed in each calendar year. This can vary based on both changes to average cost per service as well as changes in the utilization of services year to year. The prescription drug market is also changing rapidly, with new drugs being approved, drug patents expiring, and new generics being sold each year. Because Summus pulls multiple years of data to increase cohort sizes, we recommend applying a trend adjustment to each calendar year to normalize costs to a single time period (such as the most recent year of the data used).

# V. Data Reliance and Caveats

In performing our analysis, we relied on data and other information provided to us by Summus. Specifically, we reviewed case studies of selected employer clients, data summaries, and methodology descriptions. We have not audited or verified the data and other information. However, we did evaluate the information for reasonableness and consistency. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise by inaccurate or incomplete.

We relied on Summus's description of its business model insofar as the business model is reflected in the savings estimation methodology. We have not reviewed every aspect of the Summus business model that may or may not affect the savings calculated by this methodology.

We reviewed the case studies provided by Summus in both slide (PowerPoint) and spreadsheet (Excel) forms. Our review consisted of evaluating the methodology presented in either of these formats, verifying proper calculations, and evaluating the actuarial appropriateness of the methodology overall. We are only commenting on the generalized savings approaches provided to us. We are not commenting on results of any particular employer. Those reviewing Summus's calculations should take full responsibility for interpreting any results coming from this savings estimation approach and results should be reviewed by someone knowledgeable in the areas of healthcare data and statistical methods. Milliman does not intend to benefit any third-party recipient of our work product.

While we find the methodology appropriate, all methodologies, algorithms, and formulas are by nature assumption-driven. We have no opinion on the assumptions chosen for any particular calculation of savings done for any employer group.

This review incorporates Milliman's experience in working with similar programs that rely on claim data. Actual experience will differ from the savings we reviewed in various case studies. Actual savings will differ from the sample results we have reviewed for many reasons including, but not limited to: member characteristics, changes to Summus's program, benefit designs that influence utilization, and physician practice patterns, as well as other random and nonrandom factors. It is important that actual experience be monitored and that appropriate adjustments be made to the methodologies.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in all actuarial communications. The authors of this paper are members of the American Academy of Actuaries and meet the qualification standards for performing this analysis.

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