MILLIMAN REPORT

# Bupa UK

## Peer review of methodology to estimate cost impact attributable to care management initiatives

## Commissioned by Bupa UK

19 April 2024

Joanne Buckle, FIA

Milliman

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# 1. Executive summary

Bupa Insurance Services Limited in the UK ("Bupa") offers a range of products and services to its corporate health insurance clients, which aim to keep employees well, reduce sickness absence by providing fast access to healthcare, and enable employers to recruit and retain talent. Unlike consumer health insurance policies, corporate pricing is partly based on a corporate clients' claims in previous years. Employers can choose the cover that best suits their business, budget and employees' needs. Some of the services that Bupa offers to its corporate clients include care management, such as remote skin assessment and support for muscle, bone, and joint conditions.

Bupa has developed methodologies to estimate and report the claims savings associated with these care management initiatives, alongside other health outcomes, clinical quality and customer service metrics. These are reported to Bupa's corporate clients at an organisational level. Understanding the value that Bupa brings through its care management initiatives allows businesses to choose which services they wish to access and select product options to meet their employees' needs.

Bupa asked Milliman LLP UK ("Milliman") to peer review the cost savings calculation methodologies for its care management initiatives. The scope of our work does not include evaluation of other metrics Bupa uses to assess the initiatives, such as health outcomes, clinical quality, or customer service.

This report contains our overall conclusions, our review approach and feedback comments, caveats and limitations associated with both our review and the underlying methodology for the cost savings. Our work is not intended to indicate that we have validated any specific savings number reported.

From our review, carried out in 2023, we conclude that the methodology Bupa uses to estimate the potential financial impacts of its care management initiatives are reasonable and appropriate for the intended use. Bupa's approaches for quantifying savings are consistent with typical actuarial practices to estimate the financial impact of similar initiatives. Based on our review, we can confirm that we are happy for Bupa to add the following statement to its Healthcare Report as long as the saving calculation methodologies remain materially unaltered. The statement does not apply to initiatives that we have not reviewed during this evaluation in 2023:

***"Milliman, one of the world's largest providers of health actuarial services, has reviewed the evaluation methodologies used to estimate savings for the care management initiatives presented in the Healthcare Reports and concluded the methodologies are reasonable and appropriate."***

Our review considered:

- The appropriateness of the savings methodologies developed by Bupa to demonstrate the impact of Bupa's care management initiatives at a corporate client level;
- Identification of the major assumptions used; and
- The sensitivity testing carried out by Bupa of the major assumptions and the overall impact on reported savings.

Our review was based on a care management savings methodology evaluation checklist developed by us which includes criteria relating to initiative design, evaluation methodology, and monitoring. This checklist was developed based on UK technical standards for all actuarial work to ensure that the data used is complete and appropriate for modelling, the assumptions and limitations of the methodology are clearly articulated, and the sensitivity of the savings estimates to key assumptions are well understood.

Bupa provided us with information on the initiatives, including the intended purpose, savings calculation methodology, major assumptions, and sensitivity testing of the savings estimates. Bupa also provided us with the savings results by corporate schemes and sensitivity testing to allow us to assess the variability in results using this data. Bupa provided metrics on the propensity score matching and a summary of the outputs after the calculation of the savings using the methodology for each initiative. No detailed claims or other data was provided to us.

The purpose of this report is to document the work we have undertaken for our peer review to support the statement from Milliman that Bupa uses on its savings reporting for corporate clients. It should not be used for any other purpose. This report contains important caveats and limitations of our work and should be read in its entirety by qualified professionals.

This information does not constitute an endorsement or recommendation of Bupa's care management initiatives in aggregate or for any specific group or individual, historically or in the future.

Any reader of this report must possess a certain level of expertise in areas relevant to this analysis to evaluate the significance and reasonability of assumptions along with the impact of these assumptions on Bupa's methodology and results. Milliman recommends that third parties be aided by their own actuary or other qualified professionals when reviewing this report.

# 2. Professional standards, limitations, distribution, and use

This report describes both work that I did personally and work that was performed by Milliman staff, acting under my supervision and direction. To differentiate between the two, I use plural pronouns (“we” and “our”) to identify the latter. I relied on that staff work in forming my opinion. I am a Fellow of the Institute and Faculty of Actuaries in the UK and therefore the work carried out and this Report falls within scope of the following professional guidance: Generic TAS 100: Principles for Technical Actuarial Work v2 ("TAS 100"), as approved by the Financial Reporting Council ("FRC") with effect from July 2023. We confirm that in undertaking this work and in preparing the final version of the report we have complied with the above guidance, subject where appropriate to our judgements regarding materiality and proportionality.

In performing our review, we relied on data and other information provided by Bupa, as detailed in Appendix 1. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

No reliance should be placed on any advice not given in writing, or on draft versions of our figures, reports or other forms of written communication. If distributed to third parties, the report must be shared in its entirety. Milliman does not intend to benefit, or create a legal liability to, any third-party recipient of our work product, even if we permit the distribution of our work product to such third party.

We are only commenting on the generalised cost savings methodologies that were provided to us in 2023 and evaluating the actuarial appropriateness of those methodologies overall. We are not commenting on the savings outcomes that may be achieved by any specific corporate client of Bupa’s, either historically or in the future.

While we find the cost savings methodologies documented in this report reasonable and appropriate, all methodologies, algorithms and formulas are by nature assumption-driven. While we have attempted to test the sensitivity of the results and conclusions to key assumptions to assess the robustness of the methodology, we are not providing an opinion on the appropriateness of any specific assumption.

Future experience will differ from the savings methodologies we reviewed for many reasons, including, but not limited to customer mix characteristics, external event impacts, benefit designs that influence utilisation, as well as other random and non-random factors. It is important that actual experience be monitored and that appropriate adjustments be made to the methodologies on a regular basis to ensure they remain appropriate. It is certain that actual experience will vary from expected, perhaps materially.

This report will be publicly available and therefore it could be viewed by Bupa’s 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 who review this work.

# 3. Review methodology

Our review considered the appropriateness of savings methodologies developed by Bupa to demonstrate the impact of its care management initiatives at a corporate client level. Figure 1 includes the list of the initiatives included in the scope of our 2023 evaluation:

**FIGURE 1: INITIATIVES CONSIDERED IN THIS REVIEW**

| CARE MANAGEMENT INITIATIVE | |
|---|---|
| **A.** | Chronic Eye Care |
| **B.** | Enhanced NHS Cash Benefit |
| **C.** | Digital Physiotherapy Triage |
| **D.** | Remote Skin Assessment Service |
| **E.** | Medical Reviews and Application of Policy |
| **F.** | Musculoskeletal (MSK) Physicians |
| **G.** | Direct Access - MSK |

For each initiative, we have reviewed Bupa’s savings calculation methodology, including metrics related to propensity score matching, assumptions, and sensitivity tests to understand the variability of the calculations. We have performed our review using a checklist that we have developed which includes criteria relating to initiative design, evaluation methodology, and monitoring.

Throughout this report we refer to “employees”. In many cases, the corporate client policy will also cover the dependants of employees. Therefore, in this report “employees” means either the employees covered by a corporate Bupa policy, or the dependants of those employees covered by the same corporate Bupa policy.

Any statements and conclusions that we provide in our current review are not relevant for any initiatives other than those listed above.

We recommend that the key assumptions underlying each savings calculation should be reviewed by Bupa annually to ensure the savings calculations remain robust and actuarially appropriate. Our conclusions do not apply if Bupa makes changes to the methodology after the Milliman review documented in this report.

# 4. Results and conclusions

The following sections set out each initiative we reviewed, including:

- a summary of Bupa's stated purpose for each care management initiative;
- our findings and conclusions on the cost savings methodologies, including key underlying assumptions; and
- our conclusions for each initiative reviewed.

## A. CHRONIC EYE CARE

**Bupa's stated purpose for this initiative is to ensure that eye care is covered in line with the terms of its health policies.**

Although Bupa's policies cover the diagnosis of chronic conditions and any curative treatments, in common with other UK health insurers, the policies do not usually cover the treatment and care, or monitoring and management, of chronic or long-term conditions. Bupa's policies do not cover the monitoring and drug treatment for chronic eye conditions[1], such as diabetic macular oedema and wet age-related macular oedema.

In determining cover decisions, Bupa uses the Association of British Insurers' (ABI) definition of chronic conditions, which is set out below as:

*"A disease, illness or injury which has one or more of the following characteristics:*

- *it needs ongoing or long-term monitoring through consultations, examinations,*
- *check-ups and/or tests;*
- *it needs ongoing or long-term control or relief of symptoms;*
- *it requires rehabilitation or for you to be specially trained to cope with it;*
- *it continues indefinitely;*
- *it has no known cure;*
- *it comes back or is likely to come back."*

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | The savings value for each corporate client is calculated by comparing actual spend for chronic eye care in the evaluation period with the expected spend by month and age band. The expected volume is calculated as the actual value using the data for the same month in the prior year (the prior period), adjusting for the change in the number of lives and seasonality. COVID-19 disruption factors were calculated by overlaying the volume trends for 2017-2019 onto 2020 data to estimate the expected volume of claims without COVID-19. Using this forecast line and the actual volumes, COVID-19 disruption factors were then applied to the expected volumes used in the savings calculation to ensure a like-for-like comparison. Expected volume is multiplied by the relevant average cost per age band to determine the total expected spend.<br>Since the expected volume is based on the actual volume from the prior period, as the actual volume continues to reduce, the expected volume will also continue to reduce over time.<br>Savings per life were calculated by age band for all Bupa's corporate clients and then applied to the number of lives for each corporate client, whether or not there were any beneficiaries in that time period for a specific corporate client. |
| **Major assumptions underlying the savings methodology** | 1. The experience of each corporate client is representative of the experience of all corporate clients in aggregate.<br>2. There is minimal variation in average cost per employee within each age band.<br>3. There is minimal variation in expected utilisation and average cost between regions.<br>4. Expected utilisation does not need to be adjusted for trend. |
| **Sensitivity testing** | 1. It is appropriate to make an adjustment for different corporate risk profiles.<br>2. Analysis provided shows that the distribution of cost per employee is similar across age bands, however, there is a wide distribution in average cost per employee.<br>3. Analysis provided shows material variation in the average cost per claim by age, region, and treatment type.<br>4. The trend assumption was not tested, and hence is included as a recommendation by Milliman. |
| **Overall conclusion** | Overall, we find the savings calculation methodology reasonable and appropriate. Saving calculations are calculated by age band to allow adjustment for different risk profiles. However, we note below limitations of the savings methodology:<br>1. Analysis of change is carried out at a corporate client level and shows variation in savings due to recent changes in methodology. Since each corporate client has a different risk |

[1] https://www.abi.org.uk/globalassets/files/subject/public/health/sobp_pmi_sales_2017-002.pdf

| | |
|---|---|
| | profile and number of individuals enrolled in the initiative, any analysis of change may be better estimated on a "per life" basis.<br>2. Analysis provided by Bupa shows that the distribution of cost per employee is similar within an age band, however, there is a wide distribution in average cost per employee by age band. Bupa should consider identifying additional reasons for variation in average cost per employee by age band and factoring these into the calculations for future evaluations.<br>3. We note a high variance in average cost between regions and treatment type, which are not currently factors in the saving calculations.<br>4. Expected volumes are not adjusted for claims utilisation trends which we recommend are considered in future as per actuarial best practice |

### B. ENHANCED NHS CASH BENEFIT

**Bupa's stated purpose for this initiative is to provide extra financial support for the substantial unexpected costs that often arise when people are seriously ill, such as additional travel expenses, paying for domestic help, or covering a decrease in income if customers are less able to work.**

Bupa's customers say that being able to choose where they have treatment, whether in private or NHS hospitals and clinics, is important to them. They may choose to have their treatment provided by the NHS because, for example, they live close to an NHS hospital with specialist treatment facilities.

If Bupa customers choose NHS care for treatment that would be covered by their policy, they can claim on their policy and receive a payment so they can continue to get value from their health cover in a way that suits their personal needs at that time. This is a common benefit provided by UK health insurers.

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | The savings value for each corporate client is calculated by subtracting the total payments sent to beneficiaries from the total projected costs Bupa would have incurred for qualifying private medical treatments during the evaluation period. The total projected costs are estimated by multiplying the utilisation of covered services by condition-specific reference costs and are adjusted for treatment location. Reference cost methodologies differ between oncology and non-oncology services and Bupa froze reference costs at pre-pandemic levels during the February 2020 – December 2021 period to ensure that inflation specific to the COVID-19 pandemic was not captured in the savings calculations. Additionally, savings were only realised for individuals if there was evidence that the beneficiary considered claiming for their care through their PMI coverage.<br><br>Eligibility for the benefit is dependent on each corporate client's terms and conditions. Authorised individuals are permitted to receive payments for pre-approved medical treatments and the benefit amount for each treatment corresponds to the complexity of the procedure.<br><br>Savings were calculated for each claim separately and then were aggregated to determine the ultimate savings for each corporate client. |
| **Major assumptions underlying the savings methodology** | 1. Employees should only be included in the savings calculation if there is evidence that the initiative had a direct impact on employee behaviour. The methodology only recognises savings for employees if the employee had related private healthcare claims up to 90 days before the NHS treatment date or if there were notes on the employee's record indicating there was a cash benefit conversation.<br>2. Treatment costs differ significantly between Central London and the rest of the UK.<br>3. For cancer claims, the number of units billed per radiotherapy episode between private and cash benefit NHS settings is assumed to be the same.<br>4. Savings are reported in the month when the NHS cash benefit claim is paid, as opposed to the treatment month; this aims to reduce variability in savings. This adjustment addresses the initial variability caused by the time lag between the treatment date and the reporting date of the claim.<br>5. For cancer claims, due to lack of data categorised by tumour type and level, an aggregated treatment cost across all cancer types is used for oncology surgery cash benefits. |
| **Sensitivity testing** | Historically Bupa carried out sensitivity testing for the reported savings dependent on the assumed percentage of employees who would have pursued care through the NHS, regardless of the existence of the cash benefit. Bupa has now elected to use a value for this assumption derived from historical data. Bupa did not conduct sensitivity testing for any of the assumptions mentioned above. |
| **Overall conclusion** | Overall, we find the savings calculation methodology reasonable and appropriate. However, we note below limitations of the savings methodology:<br>1. The savings calculation is dependent on the adjustment factors used for the percentage of employees who considered receiving private healthcare. Bupa should actively assess and refine the current assumption to ensure its continued validity in the future.<br>2. For cancer claims, data related to employee tumour types are not readily available. As a result, savings calculations are not developed at the procedural level of granularity. The calculations have been based on aggregate treatment costs across all types of cancer and savings may differ for a specific corporate client if the mix of cancer claims varies from the mix across all corporate clients in aggregate. |

### C. DIGITAL PHYSIOTHERAPY TRIAGE

**Bupa's stated purpose for this initiative is to provide customers with fast access to appropriate care, as it says that many customers report difficulties obtaining an appointment with their General Practitioner (GP). Bupa says that on average, people who use physiotherapy triage have 25% fewer surgeries compared to those who access care via a GP.**

If a customer has a musculoskeletal ("MSK") symptom, they can access digital physiotherapy by speaking to a physiotherapist within 24 hours, without the need for GP referral. The physiotherapist can assess the customer's symptoms and provide immediate help. If the customer has had, or is waiting for, treatment for a MSK condition, they can access Bupa's dedicated case management support, which can include personalised exercise programmes, aimed at helping them get fit for further treatment and boosting the chances of a faster recovery.

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | The overall monthly savings per pathway for individuals initiating their pathway through this initiative were determined by analysing data from all Bupa corporate clients. To calculate these savings, Bupa compared employees who accessed care via this initiative with those who did so via their NHS GP (the control group). To ensure that these two groups were similar in terms of their clinical characteristics at the beginning of the pathway, Bupa conducted propensity score modelling, considering the following factors:<br>1. Demographics such as age and gender.<br>2. Specific body part or area of concern.<br>3. Employee's location.<br>4. Type of insurance product.<br>5. The number of months required to achieve desired outcomes in the pathway.<br>6. The year when the pathway commenced.<br>The same methodology was applied to calculate treatment costs for both groups. Bupa compared the total costs of the control and intervention groups, which included expenses related to physiotherapy, the number of surgeries, diagnostic tests and consultations, at the same stage in their respective pathways. Since there was limited data available for pathways lasting 12 months or longer, the current methodology considers all pathways shorter than 12 months and adjusts the results to account for the varying lengths of these pathways. |
| **Major assumptions underlying the savings methodology** | 1. Experience observed in the control group sample can be applied uniformly to individual corporate clients.<br>2. That the employee would have used Bupa's digital GP service rather than the physiotherapist, and that the use of the digital GP service does not lead to an overall increase in volume.<br>3. Pathway duration is 12 months. |
| **Sensitivity testing** | 1. The control group and intervention groups were established through propensity scoring, which relied on a representative population across all business sectors. This process has minimised discrepancies in risk profiles (or mix) between the two groups, ensuring that the findings are relevant to groups with varying levels of risk.<br>2. Currently, there is no noticeable increase in utilisation associated with this initiative, as there is a concern that employees may prefer Bupa's digital GP service over sessions with a physiotherapist.<br>3. The assumption of a 12-month pathway duration was not tested, and we have added a recommendation in the overall conclusion section below. |
| **Overall conclusion** | Overall, we find the savings calculation methodology reasonable and appropriate. For future evaluations, we recommend the following:<br>1. Presently, there is no observable rise in overall utilisation attributed to this initiative to offset any pathway savings, although it is possible that the initiative leads to higher overall utilisation. This assumption is pivotal and necessitates ongoing monitoring.<br>2. The methodology focuses exclusively on pathways lasting up to 12 months. However, based on the data available so far, at the 12-month milestone, these pathways encompass only 84% of the total pathway cost. We acknowledge that the decision to cap at 12 months is influenced by the limited statistical credibility given the low number of pathways beyond 12 months. We recommend that once the data is more credible, Bupa, considers evaluating the |

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| | entire duration of pathways in the future to provide a more accurate representation of potential savings. |

### D. REMOTE SKIN ASSESSMENT SERVICE

Skin cancer is the most common cancer in the UK[2] and research indicates that early diagnosis of cancer improves health outcomes for customers and saves lives[3].

**Bupa's stated purpose for this initiative is to enable customers to check for signs of skin cancer from home and give them rapid access to remote skin assessment services, offering a response from a dermatologist within 48 hours of uploading an image of a concerning area of skin or description symptom on a smartphone.**

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | Skin assessment pathways are defined and flagged as "remote assessment" or "initial consultation", depending on how the original concern was initially addressed. Remote assessment pathways were followed for a 6-month outcome period while initial consultation pathways were followed for 4 months to account for a similar proportion of spend over a 12-month outcome period. Chemotherapy or surgery costs were excluded. Propensity score matching was carried out based on employee demographics and the individual employee's claiming experience from the 12 months prior to the initial consultation or remote assessment. For each remote assessment pathway, the average cost per month was compared with the matched initial consultation pathway. The savings amount per pathway month was calculated as the difference between the two types of pathways. Both matched and non-matched pathways were adjusted for the incidence increase and the savings per pathway month was then applied to the adjusted incidence.<br>The pathway savings assumption for a specific corporate client was used if the corporate client had more than 5 pathways. For lower volumes, the pathway savings assumption across all corporate clients in aggregate was used. |
| **Major assumptions underlying the savings methodology** | 1. The experience seen in the control sample is applied uniformly to specific corporate clients.<br>2. The cost per pathway for remote assessment pathways that were not matched to similar initial consultation pathways is similar to those that were matched, so matched pathway savings can be applied to all pathways.<br>3. To include similar proportions of the 12-month outcome spend, remote assessment pathways with a 6-month outcome period were compared to initial consultation pathways with a 4-month outcome period. The key assumption is that the time for the pathway cost to develop in the two different types of pathways will remain the same.<br>4. The incidence rate assumption is determined based on the start date of the pathway and is uniformly applied throughout each month of the pathway period.<br>5. Smaller organisations with fewer pathways will match the claims profile of larger organisations. |
| **Sensitivity testing** | 1. As the control group and intervention groups were determined using propensity scoring, differences in the risk of each population have been minimised, making the results applicable to groups of different risk levels.<br>2. There did not appear to be a significant difference between the pathway costs of a matched remote assessment pathway vs. a non-matched remote assessment pathway.<br>3. Sensitivity analysis around different outcome periods for the two types of pathways showed similar pathway savings.<br>4. Savings depend significantly on the assumption regarding the pathway incidence rate assumed due to ease of access to the remote assessment pathway.<br>5. The savings were based on pathways from a specific corporate client compared to their matched pathway from the control group of pathways. However, if a corporate client had remote assessment pathways that have not been matched to initial consultation pathways, then the average saving per pathway was used if the corporate client has more than 5 pathways. |
| **Overall conclusion** | Overall, we find the savings calculation methodology appropriate and reasonable. For future evaluations, we recommend Bupa considers ways to increase the level of credibility in the underlying skin pathways data. Low credibility leads to increased variability in outcomes and decreased usefulness in assumption setting. If it is determined that Bupa must rely on small sample sizes, we suggest that Bupa carries out sensitivity testing for the impact that changes in |

[2] https://www.britishskinfoundation.org.uk/

[3] https://www.cancerresearchuk.org/about-cancer/cancer-symptoms/why-is-early-diagnosis-important

| | |
|---|---|
| | the incidence adjustment would have on the overall savings calculation for each corporate annually. |

## E. MEDICAL REVIEWS AND APPLICATION OF POLICY

**Bupa's stated purpose for this initiative is to ensure that its policies cover treatment that represents best practice in the UK medical profession, such as guidance from the National Institute for Health and Care Excellence or the specialty-specific organisations and medical Royal Colleges.**

For specific treatments or at points in the treatment journey where there are accepted best practice guidelines and evidence that over-treatment can occur, Bupa asks clinicians for more information about the proposed treatment. This enables Bupa to check that its policies only cover treatment and care in line with clinical best practice, avoiding potentially unnecessary and risky surgery. In larger hospitals dealing with more complex cases, Bupa has onsite hospital care co-ordinators who work alongside nursing staff, consultants, and medical directors supporting customers' care plans.

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | The impact and savings of the medical reviews and application of policy is determined by comparing the actual treatment incidence rates with the expected incidence rates by treatment. The expected incidence rates are calculated by employing regression techniques using predictive models based on historical data post-initiative. Post-initiative savings percentages were calculated in contract year one and year two and then were applied to the expected spend at a corporate client level in subsequent years. Savings percentages are based on historical data and are assumed constant over the future years. |
| **Major assumptions underlying the savings methodology** | 1. The relationship between treatment incidence and its drivers are relatively static over time.<br>2. Reduction in the incidence of each procedure can be attributed to the medical reviews and application of this policy initiative.<br>3. The volume of treatment episodes has not yet reached the levels observed before the introduction of this initiative. |
| **Sensitivity testing** | 1. Assumption 1 and 2 above were not sensitivity-tested.<br>2. To address employee behavioural changes related to medical care utilisation during the COVID-19 pandemic, Bupa developed alternative savings percentages and sensitivity-tested the impact on aggregate savings and there was a post-initiative delay in savings being realised. |
| **Overall conclusion** | Overall, we find the savings calculation methodology reasonable and appropriate. The regression models consider several key characteristics, including condition-based prevalence rates, medical history with a related procedure, population demographics, client industry and presence of bespoke medical review teams with a client, when predicting claims incidence rates. However, in addition to the major assumptions listed above, we note below the limitations for this initiative:<br>1. The analysis of change is calculated for each corporate client separately. As each corporate client has a different risk profile and number of employees, it may be more appropriate to analyse on a "per-employee" basis.<br>2. Bupa calculates the saving percentage as the maximum of savings in contract year one and two and applies this percentage in subsequent years. Using the past historical calculated saving percentage might not be appropriate in subsequent years due to changes in volume mix, business mix, changes in savings calculation methodology, and external environment. Use of maximum savings across the two contract years might lead to over-inflated savings estimates. |

### F. MSK PHYSICIANS

**Bupa's stated purpose for this initiative is to reduce potentially unnecessary referrals to orthopaedic surgeons, along with unwarranted diagnostics and follow-on surgery.**

Customers with a GP referral to a surgeon have the option of an in-depth assessment with an MSK physician. During this assessment, all suitable treatment options are discussed, which Bupa says empowers the customer to make the right decision for their condition, including other clinically appropriate alternatives to surgery. In some cases, Bupa's experts may identify an urgent need for treatment and advise the customer to attend a local Accident & Emergency centre, helping customers receive the treatment they need as soon as possible.

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | An overall saving per pathway per month for those starting their pathway via MSK physicians was calculated based on all Bupa's corporate clients in aggregate. To calculate the savings, employees accessing care via MSK physicians were compared with employees accessing care via their NHS GP (the control group). To ensure that these two groups were comparable, propensity score modelling was conducted. The overall cost for control group and intervention group, including physiotherapy spend, number of surgeries, diagnostics, and consultations were compared at the same point in their pathways. |
| **Major assumptions underlying the savings methodology** | 1. Experience in the control group can be applied uniformly to each specific corporate client.<br>2. It is appropriate to create a new pathway if there is a gap of 9 months or more between MSK physician consultations.<br>3. The pathway duration is 12 months.<br>4. COVID-19 had similar impact on employees accessing care via a traditional GP and MSK physician.<br>5. The total savings per pathway for individuals seeking care through MSK physicians compared to NHS GPs were calculated using data from all Bupa's corporate clients in aggregate. The savings are fixed for each pathway, and more than 80% of the savings are realised within the initial 5 months. Consequently, the overall savings are distributed over a 5-month period for each pathway per month from the pathway start date. |
| **Sensitivity testing** | 1. As the control group and intervention groups were determined using propensity scoring, differences in the risk of each population have been minimised, making the results applicable to groups of different risk levels.<br>2. Assumption 2 listed above was not tested. We have added a recommendation in the overall conclusion section below for Bupa to conduct an analysis of change when any changes are made to the methodology.<br>3. Bupa provided us with supporting analysis illustrating that similar savings were realised when following a pathway for 12 months vs. 24 months, as well as the impact of COVID-19 on both the control and MSK physician pathway.<br>4. Bupa provided us with analysis to show that that the number of monthly pathways initiated through a GP was consistent during 2020 with the number of monthly pathways initiated by an MSK physician.<br>5. Assumption 5 was not tested, and we added a recommendation in the overall conclusion section below to adjust savings depending on an employee's journey within the pathway. |
| **Overall conclusion** | Overall, we find the savings calculation methodology reasonable and appropriate. For future evaluations, we recommend the following:<br>1. Enable flexibility in savings adjustments according to the specific month of an employee's progress within the pathway, reflecting the actual realisation of savings in the future, rather than setting fixed amounts per pathway per month.<br>2. Conduct an analysis of change when substantial changes are made to the evaluation methodology to assess the impact on savings for future evaluations.<br>3. Sensitivity-testing of all the major assumptions. |

## G. MSK DIRECT ACCESS

MSK conditions are one of the top reasons for both short and long-term work absences[4]. This can be costly to businesses, with 18.3 million working days reported as being lost in the UK in 2020 due to MSK problems[5].

**Bupa's stated purpose for this initiative is to offer fast access to MSK advice, usually without the need to see a GP first**. If a customer calls Bupa with a MSK problem, Bupa will arrange a telephone or video consultation with a senior physiotherapist. In 2021, according to Bupa's own data, 80% of customers had an appointment within 24 hours of calling. Bupa's physiotherapists offer advice on managing pain and can refer to a specialist if required, in most cases without the employee needing to see a GP first.

| EVALUATION CONSIDERATION | FINDINGS |
|---|---|
| **Savings methodology** | The savings methodology employed a comparative approach, contrasting employees utilising the Direct Access (DA) service in the intervention group with those accessing MSK treatment through the traditional GP pathway in the control group. Claims that are self-managed, indicating no additional treatment post-consultation, were excluded from the analysis due to the lack of a suitable control group for risk adjustment. Exclusion criteria further involved eliminating outlier pathways representing the highest 0.5% of spend.<br>To ensure comparability between groups, propensity score modelling was utilised to match intervention group pathways to control group pathways. Unmatched pathways were then matched to the control group based on a more limited set of key risk factors. Matching was conducted by aligning intervention pathways with control pathways that commenced in the same year, accounting for COVID-19-related disruptions and cost inflation and shared the same available outcome period.<br>The subsequent analysis involved a comparison of costs and treatment outcomes between the intervention and control groups. Notably, the cost of the DA telephone assessment was incorporated into the overall intervention pathway cost. Additionally, an adjustment was made to consider the impact of DA on facilitating employee access to MSK treatment, leading to an associated increase in MSK incidence. |
| **Major assumptions underlying the savings methodology** | 1. To assess the cost of additional pathways resulting from the introduction of this initiative, we rely on the median cost per DA pathway. This approach assumes that lower cost pathways would be the ones which are predominantly used, due to increased accessibility.<br>2. The experience seen in the control sample can be applied uniformly to individual corporate employees.<br>3. It is reasonable to reconcile unmatched pathways by eliminating certain risk factors.<br>4. The pathway duration is 12 months, with no adjustments made for pathways extending across multiple calendar years. However, the cohort of employees under consideration was tracked over a two-year period.<br>5. Self-managed DA pathways were excluded because of a lack of suitable control group within the GP population.<br>6. Taking into account the outcome period for the pathway ensures the stability of matched pathway costs, preventing any impact on savings from variations in the duration of incomplete pathways.<br>7. Outlier pathways with spend in the highest 0.5% were excluded. |
| **Sensitivity testing** | 1. We have reviewed Bupa's sensitivity testing analysis concerning assumption 1 and determined that the assumption used is reasonable.<br>2. As the control group and intervention groups are determined using propensity scoring, differences in the risk of each population have been minimised, making the results applicable to groups of different risk levels.<br>3. In the utilisation of propensity score matching, not every pathway was aligned using the complete set of risk adjustment factors. Unmatched pathways exhibited distinct characteristics compared to the matched pathways. Consequently, it seemed inappropriate to apply pathway savings calculated from the matched pathways directly to the unmatched pathways. Therefore, the primary reasons for differentiation were identified between matched and unmatched pathways. They were then matched to the control group based on a more limited set of key risk factors. |

[4] CIPD health and wellbeing at work, 2021

[5] Office for National Statistics, Sickness absence in the UK labour market: 2020

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| | 4. Assumption 4 listed above was not formally assessed; however, a cohort of employees is tracked for a two-year period.<br>5. Assumption 5 listed above appears suitable when employing the propensity risk scoring method for the purpose of risk stratification.<br>6. The results from propensity matching include the influence of incomplete pathways, and the matching process has appropriately considered the outcome period.<br>7. The total number of pathways identified as outliers was not significant. |
| **Overall conclusion** | Overall, we find the savings calculation methodology reasonable and appropriate. For future evaluations, we recommend the following:<br>1. Monitor the use of the median cost per DA pathway for additional utilisation to ensure its ongoing validity.<br>2. Calculate the additional utilisation attributed to ease of access solely for all corporate clients, rather than relying on the entirety of Bupa's policies. |

# 5. Other considerations

For Medical & Policy Reviews and the Remote Skin Assessment Service initiatives, Bupa sets any negative savings at the corporate client level to zero, on the assumption that these negative savings are due to statistical noise, especially given the relatively small numbers involved for certain corporate clients. Bupa provided us with some analysis showing the following impact of this:

- Medical & Policy Reviews: None of the corporate clients had a negative savings estimation.
- Remote Skin Assessment: While the methodology resulted in the majority of corporate clients having positive savings reported, for the years we reviewed, there was a significant minority of corporate clients that have negative savings (although the methodology resulted in positive savings in aggregate for the initiative). The proportion of corporate clients with negative savings estimates is reducing over time as the dataset becomes larger and more credible. We recommend that Bupa assesses the ratio of negative savings to total savings annually to test whether setting a minimum of zero for savings for each specific corporate client is having a material impact on the stated savings.

For all calculations we recommend that Bupa assesses the critical assumptions on an annual basis to ensure that they remain appropriate.

We also recommend that Bupa reviews any calculations that use a pre-post methodology annually to determine if the methodology remains valid over time.

# Appendix 1: Data received

This peer review of the savings calculation methodologies for Bupa's care management initiatives relies on the data and reports shared by Bupa in 2023. For each initiative, Bupa provided responses to our evaluation checklist, an analysis of propensity risk scoring that included the list of utilised risk factors, breakdowns of savings specific to corporate entities, any identified increases in utilisation along with the corresponding impact on savings, sensitivity analyses of assumptions, documentation of changes in methodology, and an assessment of the resulting impact on savings. We were also provided data giving insights into the influence of COVID-19 experience on relevant parameters.

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**CONTACT**

**Joanne Buckle**
joanne.buckle@milliman.com