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Monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (MAFEIP)

Second report on outcome indicators

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Abstract

IPTS in cooperation with DG CNECT and DG SANCO is developing a monitoring framework to assess the evolution and impact of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA). In an earlier report, a set of candidate indicators was suggested which may allow efficient monitoring of the impact of the EIP on AHA on the Triple Win and the overarching objective of increasing the life of European citizens by two healthy life years by 2020. This report builds on previous work on outcome indicators by analysing data from a survey on outcome indicators used or intended to be used by commitments participating in the EIP on AHA, which was carried out in February-April 2014. For the Quality of Life column of the monitoring framework, our analysis focussed not only on the recurrence of each indicator, but also on the potential coverage of commitments achieved through primary as well as common and specific secondary indicator candidates. For the sustainability of health and care systems column of the framework, previous findings could be confirmed through the survey data with regard to the type of resources reported by commitments. The analysis of the survey data confirms and strengthens a number of findings presented in the MAFEIP First report on outcome indicators. However, the indicators discussed here still constitute a long list of potential candidates which may be refined in the future when it comes to linking outcomes to the EIP on AHA objectives.

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1. Introduction

IPTS in cooperation with DG CNECT and DG SANCO is developing a monitoring framework to assess the evolution and impact of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA). In an ideal monitoring situation, standardised data would be collected from the activities to be monitored on a set of common indicators. However because of the bottom-up approach of the EIP on AHA, there is a diversity of commitments and a consequent need to monitor them in different ways since standardised data may never be fully available.

To refine the initial monitoring framework, and in the absence of reference data, the previous deliverable ("MAFEIP First report on outcome indicators"¹, henceforth "First report on outcome indicators") reported on a joint review of several sources of information available up until November 2013 which provided insights into the use of outcome indicators and which were either directly or closely related to the activities undertaken by the EIP on AHA commitments, namely:

- The 2012 data that shaped the initial monitoring framework
- The data from 71 good practices submitted by EIP on AHA Reference Sites
- And the data from good practices of EIP on AHA Action Groups A1, A3, B3 and D4

To inform the choice of outcome indicators proposed for use in the MAFEIP project, the above mentioned sources were collated in a single database. The rationale was that each single source of information may not be adequate to inform the choice of outcome indicators for the monitoring framework of the EIP on AHA on its own, however, in conjunction the various sources may support or refute the use of particular outcome indicators. In addition, a systematic scientific literature review was conducted to further inform the choice of outcome indicators. Finally, we considered aspects of linking outcome indicators to the headline target of two additional Healthy Life Years (2HLYs) and the Triple Win in order to discriminate between a set of "*primary outcome indicators*" and "*secondary outcome indicators*". Primary outcome indicators are not just relevant across a number of commitments and Action Groups, but also particularly well suited to establish a quantitative link to the Triple Win and the headline target. Secondary outcome indicators require more elaborate modelling approaches to establish a quantitative link to primary outcome indicators first, and ultimately to the Triple Win and the headline target. Further, secondary outcome indicators could be either common across several Action groups or specific to a particular Action Group.

As a result a short-list of potential primary and secondary outcome indicators was defined (see Table 1 below) and arguments were developed for the inclusion or exclusion of each indicator for the purpose of modelling the outcomes of the EIP on AHA interventions on its overall targets.

This deliverable takes the work presented in the First report on outcome indicators one step further whilst analysing data that has become available in February-April 2014 through a survey on outcome indicators answered by Action Group commitments. For the Quality of Life column and for each Action Group we have not just considered the importance or recurrence of each indicator, starting from the common primary indicators, and continuing with the common secondary indicators, but also overlaps between them, so as to determine the share of commitments that are not measuring primary indicators and for which one would have to rely only on secondary indicators. We further checked the relevance of specific secondary indicators according to the survey so as to confirm inclusion or exclusion of these indicators. Finally for the sustainability column, we confirmed through the data from the survey the type of resources used as measured by commitments (as much as this was possible from the very limited data available).

¹ https://ec.europa.eu/jrc/sites/default/files/jrc91162_0.pdf

Table 1: Provisional proposal for outcome indicators

	Quality of Life Column		Sustainability of Health and Care Systems Column
	Primary indicators	Secondary indicators	
Common indicators	<ul style="list-style-type: none"> - Health related Quality of Life (HRQoL) - Mortality 	<ul style="list-style-type: none"> - Risk Factors - Physical Activity 	<ul style="list-style-type: none"> - Health and care resource use (<i>e.g. no of visits to primary care; measures of hospital / emergency admission and length of stay</i>) - Unit cost data (to value health and care resource use)
Specific indicators*	n.a.	<ul style="list-style-type: none"> - Adherence to treatment (A1) - Frailty (A3) - Cognitive decline (A3) - Functional status (A3 / B3) - Falls (A2 / C2 / to some extent A3) 	n.a.
Items for consideration		<ul style="list-style-type: none"> - Mental health – in particular depression - Nutrition 	<ul style="list-style-type: none"> - Patient / user satisfaction

* Some specific indicators may also apply - to a certain extent - to other Action Groups than those indicated here. However, our aim was to assign indicators to those Action Groups for which the highest number of additional commitments may be covered by the proposed framework.

This report is structured as follows. Section 2 briefly describes the methodology used for the analysis of the survey data. Section 3 then presents descriptive statistics on overall survey participation, before results for Quality of Life (QoL) indicators are reported in Section 4. This is done by first addressing the frequency and coverage of each indicator, for both the whole EIP on AHA as well as at Action Group level; whilst proceeding from primary to common secondary and specific secondary indicators respectively. Special attention was given to the nutrition indicator in Section 4.4, and mental health indicators (in particular depression) in Section 4.5, as the First report on outcome indicators highlighted a number of issues related to both indicators for the purposes of MAFEIP which required further attention. Section 5 is concerned with indicators pertaining to the Sustainability of Health and Care Systems column in the EIP on AHA framework, identifying from the survey data the most common resource use items reported and deepening our analysis of the sustainability of health and care systems. Special attention was given to patient/user satisfaction as the First report on outcome indicators also highlighted this indicator. Section 6 critically appraises the relevance of the survey outcomes for the purposes of developing a quantitative monitoring framework, and provides a discussion on the implications of the survey results for the choice of primary and secondary indicators to be taken forward in the upcoming MAFEIP report on a conceptual description of the monitoring framework (modelling proposal). Section 7 concludes the report.

2. Methodology

The survey was conducted between February and April 2014 and comprised a set of questions regarding outcome indicators used or intended to be used by commitments participating in the EIP on AHA. It further allowed participants to report initial estimates (baseline results) on outcome indicators if available. The survey was structured in two parts. The first part allowed participants to state whether they used or intended to use any of the indicators suggested in the initial monitoring framework (see Annex 1 for the questionnaire). If this was the case, participants were then asked in the second part of the survey to provide further details on the respective indicator (i.e. how it was measured, elicitation tools, target groups, baseline results, etc.), although it should be noted that not all respondents provided answers on the latter.

An important characteristic of a meaningful outcome indicator for the purposes of MAFEIP is whether it is supported by a large number of commitments within and across Action Groups participating in the EIP on AHA. This is what we refer to as the 'Legitimacy' of an outcome indicator (see First report on outcome indicators for further details). As for the First report on outcome indicators, we assessed indicators' legitimacy by counting their frequency of occurrence across commitments and Action Groups and calculating respective proportions. We chose the commitment level as our unit of analysis as we aimed to assess the coverage of commitments by respective outcome indicators. The idea is that the more commitments we can cover with a particular indicator, the higher is its legitimacy for the purposes of MAFEIP. Note, however, that the commitment level was only relevant for assessing indicators' legitimacy across EIP on AHA participants in the context of this report and the First report on outcome indicators, as the quantitative modelling of outcomes will be performed on an intervention level. In this context, it is noteworthy that out of the 184 respondents answering the survey, 42 (23%) reported on several interventions (4 interventions on average). This resulted in 184 respondents reporting on 324 interventions in total. For the analysis carried out in this report, when data has been provided for several interventions belonging to the same respondent, this data has been aggregated and analysed at commitment level. For instance, if two out of three interventions mentioned in one response reported measuring physical activity, this indicator was counted once for that particular respondent. There are a number of reasons to further justify this approach for the analysis of survey data: first, given that the EIP on AHA comprises more than 500 commitments organised in six thematic Action Groups, it is not feasible to reach full coverage of all commitments by our (or any other) choice of outcome indicators. Hence, being able to assess at least some of the interventions of a commitment that delivers several interventions is probably the best we can achieve with finite resources. Secondly, at such an early stage of the project, it is questionable whether an assessment on intervention level may provide any meaningful insights, especially as the survey was answered by ca. 35% of the commitments and many of them started in 2013 or later. Finally, from our analysis, we concluded that whilst frequencies and proportions may slightly differ between commitment and intervention level, the choice of appropriate outcome indicators remains valid.

While the level of analysis for the purposes of this report is generally the commitment level, this does not mean, however, that we did not look deeper into the data provided for individual interventions. First, if respondents provided further information on the indicators they use or plan to use, we assessed whether that particular indicator was potentially adequate for the final objective of the modelling exercise, i.e. to estimate the overall EIP on AHA impact on the 2HLYs and the Triple Win. This is particularly important for health related quality of life (HRQoL), as different elicitation tools may be in use within and across commitments. Secondly, and particularly for secondary indicators, we looked deeper into the relationship between interventions delivered and the type of secondary outcome indicators reported. Only in cases where a secondary indicator candidate may be a good predictor of impact for the intervention under assessment, should we count the respective commitment as being covered by this indicator. We only looked into this connection if respondents did not report primary indicators but reported the use of a relevant secondary indicator

as we assumed an a priori preference for primary indicators for the purposes of modelling. Nevertheless, as a result the coverage achieved through secondary indicators went down. To provide an example, if an intervention aims to reduce coronary heart disease (CHD) risk by increasing patient adherence to statins, risk factors (amongst them measures of blood cholesterol) may be regarded as highly relevant indicators that could be used in conjunction with a validated CHD-risk equation such as the Framingham (D'Agostino et al., 2008) or QRISK tools (Hippisley-Cox J et al., 2007), to estimate the interventions impact on the likelihood of a future CHD-event and the subsequent impact on life expectancy and HRQoL. In contrast, if another intervention aims to improve symptoms of chronic back pain through a multimodal treatment concept, during which patients' blood pressure may be routinely taken, this risk factor may not adequately describe any treatment-induced changes in patients' health status or perceived health-related quality of life. Note, however, because of the early stages of the project, the scarcity of information, and the analytic resources available, this assessment shall only be regarded as indicative, and future efforts will have to focus much deeper on the link between interventions and measured outcomes to adapt the monitoring framework to individual interventions.

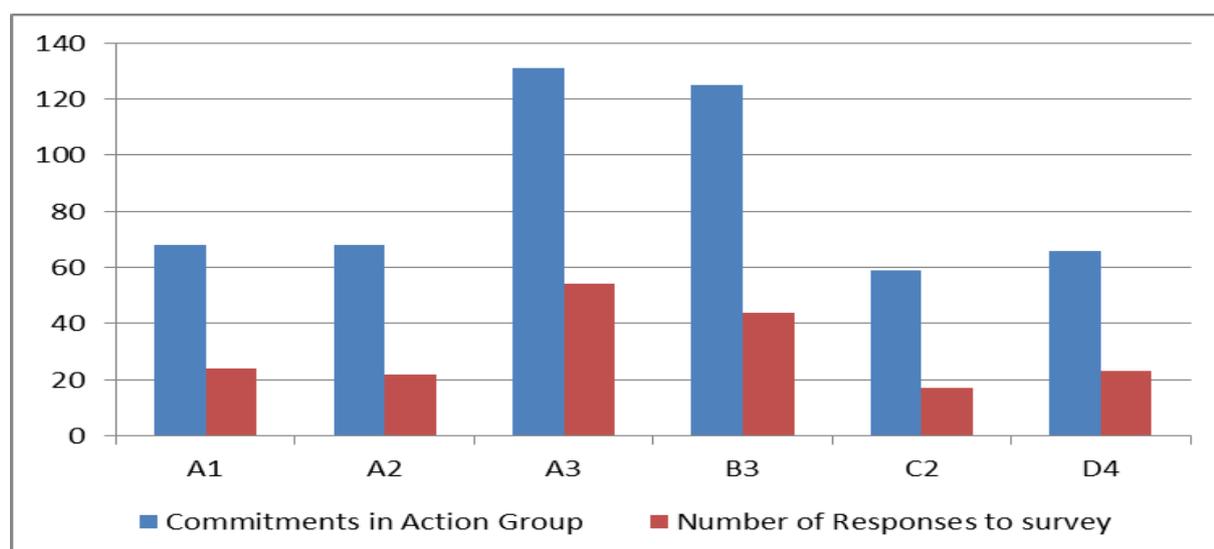
A third angle from which we reviewed the data was the overlap between respective indicators within and between respondents, resulting in an estimate of total coverage of commitments per Action Group. For instance, one respondent may simultaneously report the use of HRQoL, mortality and risk factors so that raw frequencies may increase for all three indicators. If several types of indicators are reported by the same respondent, however, we shall only regard one additional commitment to be covered as otherwise figures of coverage may be overestimated. As a result, an indicator could be 'redundant' because respective respondents are already covered by other, more favourable indicators. On the contrary, an indicator could be useful to 'close a gap' in coverage of another indicator. Both issues helped fine-tuning our short-list of potential outcome indicators as reported in Table 1 above. The assessment therefore relies on a prioritisation of indicators, with an a priori preference for primary indicators. Only if these are not available would we consider the use of common secondary indicators. Specific secondary indicators would in turn only be considered if neither primary nor common secondary indicators are available. Following prioritisation, we first checked how many respondents would be covered by primary indicators. We then looked into how many 'additional' respondents would be covered by common secondary indicators. If there was still a gap in coverage, we assessed the marginal increase in coverage through specific secondary indicators. The assessment was undertaken per Action Group, and we provide both percentages and a visual presentation using 'Venn-tables'. Percentages generally refer to the number of responses (if not otherwise indicated), and not to the total number of EIP on AHA participants in each Action Group.

Finally, based on the outcome of all three analyses, we refined the short-list of outcome indicators for the purposes of MAFEIP.

3. Overall survey participation

Before presenting results from the survey analysis on outcome indicators used or intended to be used across EIP on AHA commitments and Action Groups, we briefly report on the overall survey participation in this Section. Figure 1 and Table 2 below provide information on the overall response rate for the survey across Action Groups: data on the total participation of commitments per Action Group was obtained from the MAFEIP report on the "Second update of the process indicators"² and represents the sum of commitments from both the First and Second Invitation for Commitment.

Figure 1: Action Groups sizes and survey responses (frequencies)



The number of responses to the survey on outcome indicators per Action Group is very much proportional to the number of commitments participating in the EIP on AHA in each Action Group, so that response rates per Action Group are in the same ballpark (between 28.8% and 41.2%). Across all Action Groups, the response rate equates to 35.6% (standard deviation: 4.07%)

Table 2: Survey response rate

Action Groups	Total Nr of Commitments in Action Group	Total number of responses to survey	Overall response rate*
A1	68	24	35.3%
A2	68	22	32.4%
A3	131	54	41.2%
B3	125	44	35.2%
C2	59	17	28.8%
D4	66	23	34.8%
Total	517	184	35.6%

* Data on overall participation in the EIP on AHA covers both the 1st and 2nd Invitation for commitment and was obtained from the MAFEIP report on the "Second update of the process indicators". However, some Reference Sites joined the various Action Group later and also responded to the questionnaire: 1 in AG A1, 1 in AG A2, 3 in AG A3, 5 in AG B3, 1 in AG C2 and 3 in AG D4. As a result, the response rate in this table is slightly overestimated.

² https://ec.europa.eu/jrc/sites/default/files/jrc91174_0.pdf

Whilst the vast majority of responses (77%) reported on one intervention only, 42 respondents (23%) across Action Groups reported to have implemented more than one intervention. For these 23%, the mean number of interventions is 4, and the highest number of interventions reported by one respondent is 21. Table 3 below provides information on the number of implemented interventions per respondent respectively.

Table 3: Overview of responses and interventions by Action Group

Action Group	Total number of responses to survey	Total Nr. of interventions reported	Respondents reporting one intervention		Respondents reporting more than one intervention		
			N	%	N	%	Mean (max) Nr of interventions
A1	24	42	17	71%	7	29%	3.6 (7)
A2	22	36	17	77%	5	23%	3.8 (11)
A3	54	100	38	70%	16	30%	3.9 (10)
B3	44	65	40	91%	4	9%	6.3 (13)
C2	17	21	15	88%	2	12%	3.0 (4)
D4	23	60	15	65%	8	35%	5.6 (21)
Total	184	324	142	77%	42	23%	4.3

4. Survey data analysis: Quality of life

In this section, we first report on the frequency of short-listed outcome indicators across Action Groups within the Quality of Life column of the monitoring framework. We then look into the potential coverage of respondents per outcome indicator, before we explore further the linkage between the individual interventions delivered and respective outcome indicators reported to assess whether such indicators may be regarded as 'good predictors' of the outcome of interest. Based on this analysis, we re-assess the overall coverage by individual indicators, potential overlaps and redundant indicators, as well as the ability of indicators to complement each other in an attempt to maximise coverage. Results will then be discussed in Section 6.

4.1 Frequency of primary and common secondary indicators across Action Groups

Table 4 shows the number of responses that have reported using (or planning to use) **primary and common secondary** outcome indicators for the Quality of Life column, separately for each Action Group. Overall, 57% reported collecting (or planning to collect) data on HRQoL through different questionnaires. Action Groups A1 and D4 are the only ones for which this indicator has been reported by less than 50% of respondents (42% and 43% respectively). A detailed analysis of the instruments that are being used or that are planned to be used by respondents to collect information on HRQoL is presented further below in this section.

As for the other primary indicator, mortality, the overall frequency is lower than that of HRQoL or common secondary indicators, with slightly more than one third of all respondents reporting using or planning to use this type of indicator. For Action Groups A2, A3 and B3, the frequency of this indicator is higher than 35% while for Action Groups A1, C2 and D4 it is between 22% and 25%. Both mortality and HRQoL may allow a more direct linkage towards generic measures of health expectancy such as HLY or Quality Adjusted Life Years (QALYs). This is why mortality is regarded as a primary indicator, even though the frequency of common secondary indicators is higher for most Action Groups. More details regarding modelling the link between secondary indicators, primary indicators and the EIP on AHA headline target and the Triple Win are available from the First report on outcome indicators and will be further developed in the upcoming MAFEIP report on a conceptual description of the monitoring framework.

Table 4: Frequency of primary and common secondary outcome indicators by Action Group

Action Group	Total number of responses to survey	Primary indicators				Common secondary Indicators			
		HRQoL		Mortality		Risk factors		Physical activity	
		N	%	N	%	N	%	N	%
A1	24	10	42%	6	25%	10	42%	6	25%
A2	22	13	59%	8	36%	17	77%	13	59%
A3	54	32	59%	23	43%	36	67%	26	48%
B3	44	28	64%	21	48%	26	59%	19	43%
C2	17	12	71%	4	24%	6	35%	10	59%
D4	23	10	43%	5	22%	6	26%	14	61%
All AGs	184	105	57%	67	36%	101	55%	88	48%

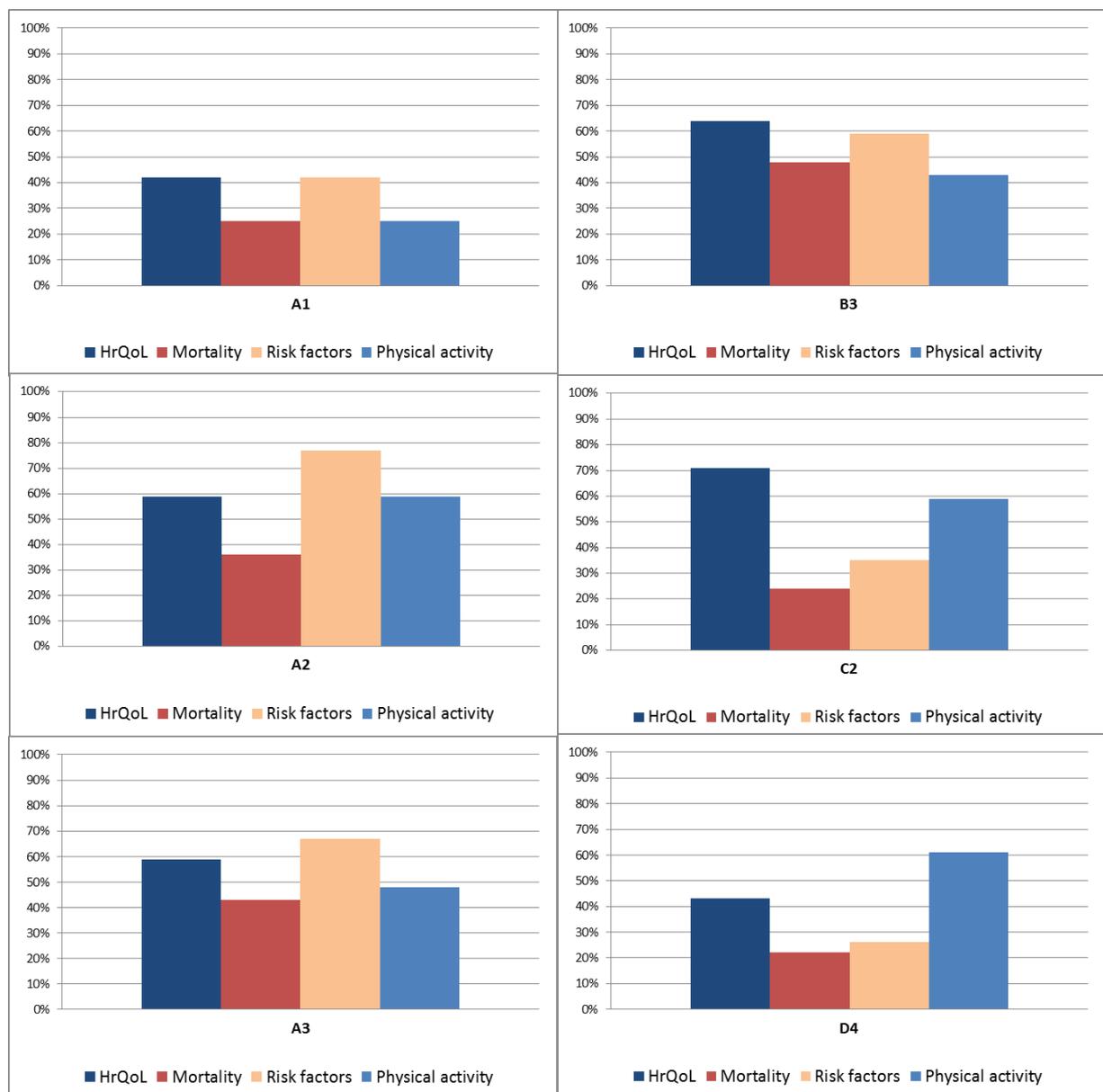
Variation between Action Groups was also found when analysing the frequency of **common secondary indicators**, i.e. risk factors and measures of physical activity. In the case of risk factors, each response was checked for the presence of one or several of the following: blood pressure,

cholesterol levels (measured as total cholesterol level (TCL), high density lipoprotein (HDL or low density lipoprotein (LDL)), glucose levels and body mass index (BMI).

More than 75% of responses in Action Group A2 reported data for at least one risk factor while just 26% did so in Action Group D4. At EIP on AHA level, the percentage of respondents reporting at least one risk factor is above 50%. The physical activity indicator has been reported by 61% in Action Group D4, and 59% in Action Groups A2 and C2 respectively, whilst only 25% in Action Group A1 reported using this indicator. At EIP on AHA level, 48% of respondents to the survey collect or plan to collect data on physical activity.

The frequency of each of the two primary and two common secondary indicators are also presented per Action Group in Figure 2 below.

Figure 2: Frequency (%) of primary and common secondary indicators by Action Group



As mentioned above, 57% of respondents reported collecting or planning to collect data on HRQoL. However, a number of generic and disease specific instruments have been initially reported, some of them only describing but not scoring health states. This has implications for the monitoring of health outcomes within the EIP on AHA, which is why for the purpose of analysing survey data, we have only considered instruments that provide HRQoL scores.

Further, different measurement tools for HRQoL may lead to different weights for respective health states, and this may induce variability in estimates of health impact which is due to the methods chosen, and not the actual change in patients' perceived health. However, the scientific literature offers methods for 'mapping', or 'cross-walking' between different HRQoL tools [e.g. Dakin, 2013], and in order to increase the generalisability of our proposed framework to different contexts, we propose either calculating or adapting existing algorithms that are published in the scientific literature to 'convert' HRQoL-scores estimated with one instrument into equivalent scores of another instrument.

For this reason, we have further analysed the survey data to obtain a clearer view of the most prevalent measures of HRQoL used across EIP on AHA commitments (Table 5 and Figure 3 below). Note, however, that we treat mental health, in particular depression-related instruments, separately in section 4.5 of this report. The main reason for this decision was that depression has been highlighted as potentially important for MAFEIP and an issue for further discussion in the First report on outcome indicators. Further, survey data showed some support for depression-specific instruments across respondents, and in order to improve transparency of reporting, we have decided not to merge this data with information on various other generic and disease specific instruments reported in Table 5 and Figure 3 below. This does not mean, however, that depression specific instruments should be regarded as entirely independent from other instruments to provide HRQoL-scores. Rather, the use of mapping algorithms as mentioned above may potentially provide a means to incorporate depression-specific information on HRQoL into the overall monitoring framework for the EIP on AHA, and this may be further followed up in future work within MAFEIP.

In total 65 out of the 104 respondents (62.5%) that indicated collecting HRQoL data have not yet specified their respective methods. For the remaining 39 responses (37.5%), the most prevalent tools are the EQ-5D instrument (14 responses) and the SF-36 and SF-12 questionnaires (13 responses combined). This represents 33% and 28% of the subset of respondents that provided information on HRQoL tools respectively. All other instruments have only been reported by 4 or less respondents that answered the survey. Hence, one particular recommendation for commitments which have not yet determined their respective elicitation method for assessing patients HRQoL could be to focus on one of the more frequently mentioned instruments such as the EQ-5D or SF-36. These instruments bear particular advantages for MAFEIP as they are:

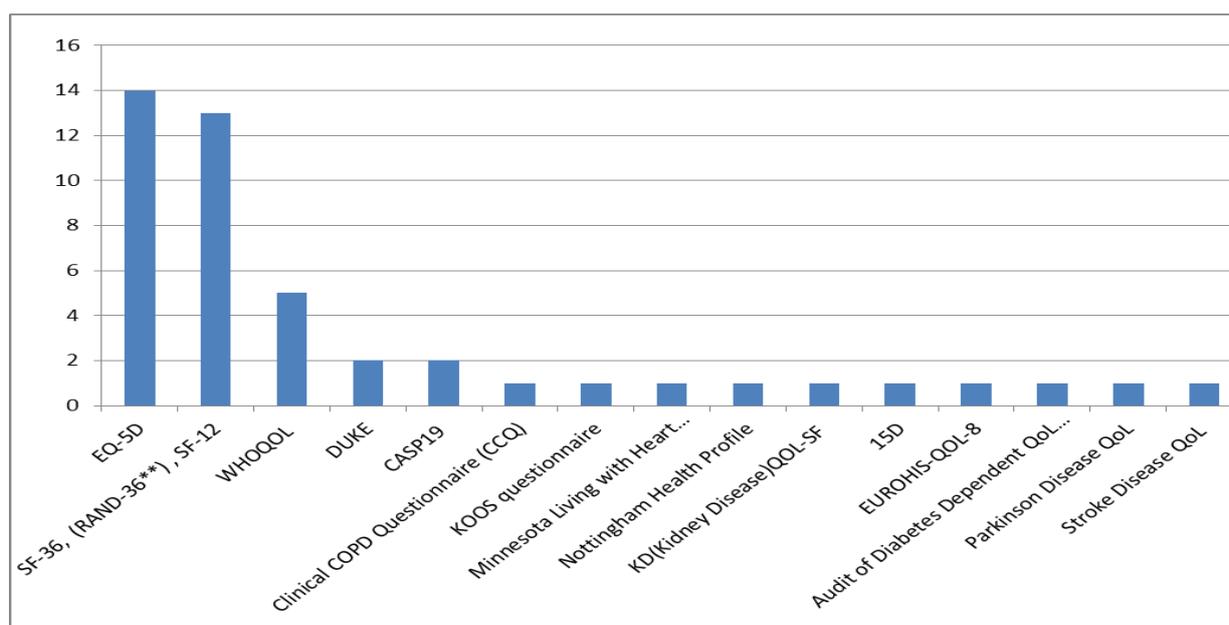
- generic (i.e. applicable across major disease areas and thereby broadly deployable within different EIP on AHA Action Groups)
- relatively straightforward to use in various settings (to allow easy and efficient data-collection) and across varying populations (for instance through the existence of validated translations into different languages)
- scientifically well established, and
- applicable to different national settings, e.g. through the existence of country-specific value sets (in contrast to the SF-36, which is a generic health profile instrument, the EQ-5D bears the additional advantage that it is preference-based (Brooks et al 2003), and if commitments consider collection of HRQoL data but have not yet decided upon the elicitation method, this tool might be particularly recommended).

Another advantage for the use of the EQ-5D to express changes in HRQoL within MAFEIP in general relates to the above mentioned method of mapping, or cross-walking, as algorithms from various other instruments towards the EQ-5D are probably most prevalent in the relevant scientific literature [Longworth & Rowen, 2013; Dakin, 2013].

Table 5: Instruments reported to provide HRQoL scores

Nr of Respondents indicating collection of HRQoL data (N=104)		
HRQoL instrument not further specified	65	62.5%
HRQoL instrument specified	39	37.5%
Nr of Respondents specifying respective HRQoL instrument (N=39)*		
EQ-5D questionnaire	14	36%
SF-36, (RAND-36**), SF-12 Questionnaire	13	33%
WHOQOL Questionnaire	5	13%
DUKE Questionnaire	2	5%
CASP19 Questionnaire	2	5%
Clinical COPD Questionnaire (CCQ)	1	3%
KOOS questionnaire	1	3%
Minnesota Living with Heart Failure Questionnaire	1	3%
Nottingham Health Profile	1	3%
KD(Kidney Disease)QoL-SF Questionnaire	1	3%
15D Questionnaire	1	3%
EUROHIS-QoL-8. Questionnaire	1	3%
Audit of Diabetes Dependent QoL (ADDQoL) index	1	3%
Parkinson Disease QoL	1	3%
Stroke Disease QoL	1	3%

Figure 3: Instruments reported to estimate HRQoL among respondents who answered this question



* Whilst 39 respondents specified the use of a particular HRQoL instrument, some of them mentioned using more than one instrument. Hence, total numbers in the second column equal 44, and percentages therefore add up to more than 100%.

**Whilst 'RAND-36' and 'SF-36' consist of an identical set of items, their respective scoring algorithms differ.

4.2 Frequency of specific secondary indicators across Action Groups

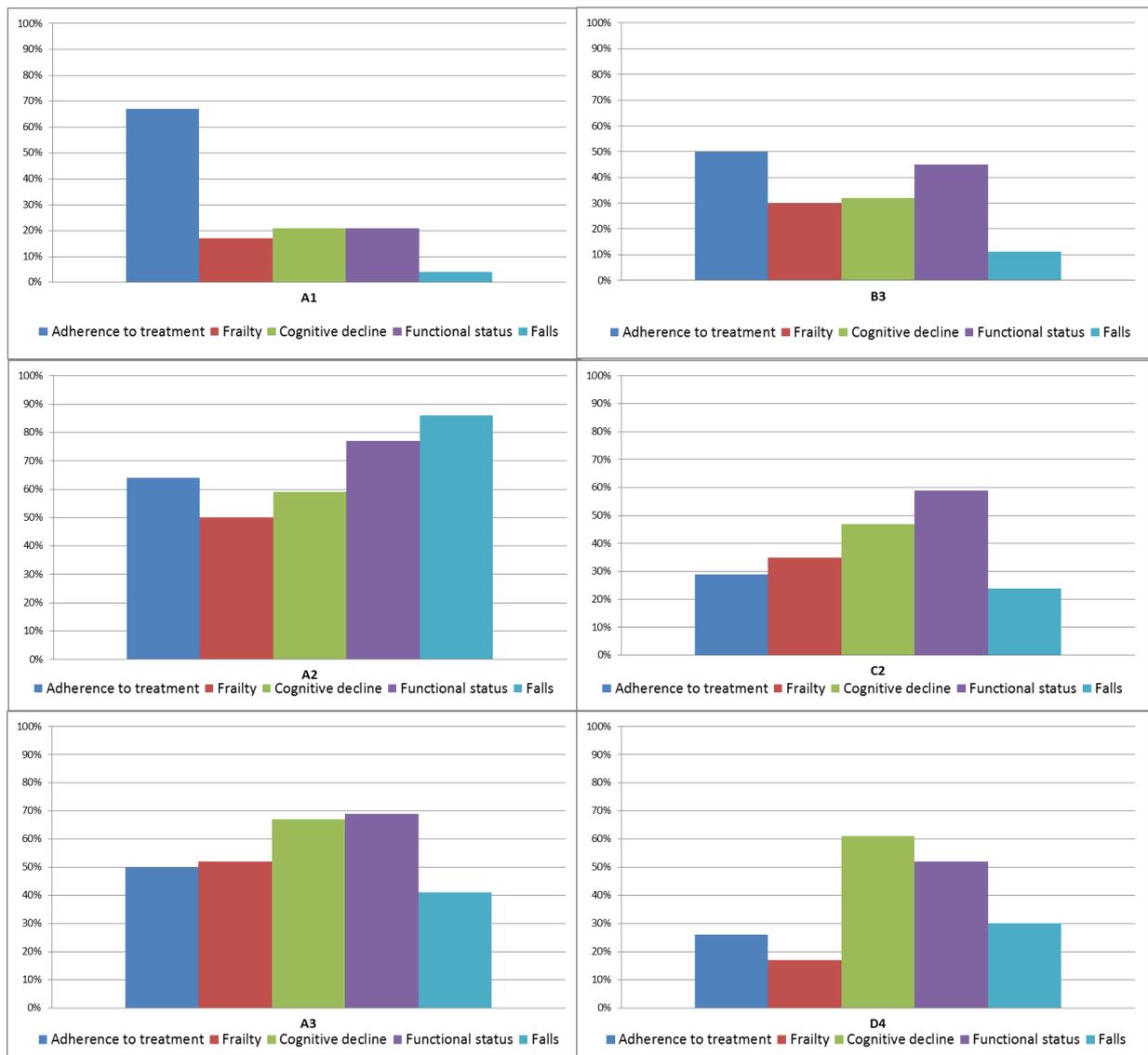
Next to those secondary indicators that are commonly supported across Action Groups, we identified a set of additional candidate indicators in the First report on outcome indicators, after the review of the good practices presented by Action Groups A1, A3, B3 and D4 in their respective booklets. We identified the following additional candidate indicators: adherence to treatment, frailty, cognitive decline, functional status and falls. However, it needs to be highlighted that for these indicators the ability to establish a quantitative link to the EIP on AHA Triple Win objectives and the headline target was less clear. We therefore regard the above mentioned indicators as a long-list of potential candidates whose ability to support the MAFEIP objectives should be investigated through further work. In this report, we aim to provide further evidence for the fine-tuning of this list by reporting a) the frequency of those indicators across Action Groups (presented in this section) and b) the additional coverage potentially achieved through specific secondary indicators after considering primary and common secondary indicators first (presented in Section 4.3 below).

Table 6 and Figure 4 show the raw frequencies and percentages of specific secondary indicators for respondents across all EIP on AHA Action Groups, irrespective of whether a particular indicator was initially suggested for use in one particular Action Group only.

Table 6: Frequency of specific secondary outcome indicators by Action Group

Action Group	Nr of responses to survey	Specific secondary Indicators									
		Adherence to treatment		Frailty		Cognitive decline		Functional status		Falls	
		N	%	N	%	N	%	N	%	N	%
A1	24	16	67%	4	17%	5	21%	5	21%	1	4%
A2	22	14	64%	11	50%	13	59%	17	77%	19	86%
A3	54	27	50%	28	52%	36	67%	37	69%	22	41%
B3	44	22	50%	13	30%	14	32%	20	45%	5	11%
C2	17	5	29%	6	35%	8	47%	10	59%	4	24%
D4	23	6	26%	4	17%	14	61%	12	52%	7	30%
All AGs	184	90	49%	66	36%	90	49%	101	55%	58	32%

Figure 4: Frequency (%) of specific secondary indicators by Action Group



Adherence to treatment was mentioned most frequently in Action Groups A1 (67%) and A2 (64%). In Action Groups A1 and B3, it was also mentioned more often than any of the other specific secondary indicator candidates. Overall, adherence was mentioned in 49% of responses to the survey. Falls indicators were supported extraordinarily strongly by 86% of respondents in Action Group A2, while it was of much lower importance in other Action Groups (below 42%). Cognitive decline was the most recurrent indicator in Action Group D4 (61%). In Action Group C2, the most recurrent secondary indicator candidate was functional status with 59%, though it was mentioned more frequently in Action Groups A2 and A3, with 77% and 69% respectively.

Raw frequencies help us to tell whether the set of indicators we chose generally has legitimacy, i.e. whether it is highly supported by EIP on AHA participants. This is obviously the case for proposed primary, common secondary and specific secondary indicators as frequencies are generally high. With respect to specific secondary indicators and based on raw frequencies only, the data supports a relatively clear choice for adherence in Action Group A1. In Action Group A2, all indicators achieved 50% or more, but falls indicators stood out with 86% of respondents mentioning to collect or planning to collect information on falls. In contrast, a number of indicators were in the same ballpark in Action Group A3, but the four most frequently mentioned indicator candidates which

were also mentioned by more than 50% of respondents were functional status (69%), cognitive decline (67%), frailty (52%) and adherence (50%). Unfortunately, none of the indicator candidates achieved more than 50% in Action group B3, with adherence to treatment (50%) and functional status (45%) being mentioned most frequently in that group. Finally, a similar picture emerges in Action Groups C2 and D4, with functional status and cognitive decline being most frequently mentioned in both groups.

What is especially reassuring is the fact that the set of specific secondary indicators suggested by the survey data per Action Group is very similar to the specific secondary indicators that have emerged from the analysis of good practices data per Action Group in the First report on outcome indicators (Table 1). Whilst results are identical across both deliverables for Action Group A1, there are only slight differences for the other Action Groups. For Action Group A2, falls are by far most relevant as they were in the First report on outcome indicators. However, adherence, functional status, and cognitive decline were also frequently mentioned in the survey. For Action Group A3, survey data do not support the use of falls indicators while the good practices did (albeit only to some extent). For Action Group B3, good practices suggested the use of functional status only, whilst survey data additionally suggests the use of adherence. For Action Group C2, falls indicators were initially proposed, whilst survey data supports the use of functional status and cognitive decline. Finally, no suggestion has been made in the First report on outcome indicators for specific secondary indicators in Action Group D4, whilst survey data supports the use of functional status and cognitive decline.

However, while they provide a good indication as to whether an indicator generally has legitimacy, raw frequencies may only help fine tune our short-list of indicators if there was neither an overlap in the use of indicators across respondents nor an a priori preference for the use of particular indicators for monitoring purposes. The question that follows is whether the inclusion of any specific secondary indicator would actually increase the coverage of commitments through our proposed list of indicators. This issue is being addressed in the following section, and data shows that the relevance of specific secondary indicators diminishes if primary and common secondary indicators are being considered first.

4.3 Coverage per type of indicator

In order to assess the coverage of respondents through our proposed short-list of indicators, we performed a sequential analysis of the data reported in Table 4 and Table 6. First we calculated the proportion of respondents which would be covered by the framework if only primary indicators were considered. We then computed the additional percentage of respondents that would be covered if common secondary indicators were added to the framework, i.e. by adding all respondents that did not report primary indicators but did report either risk factors or physical activity measures (Table 7). We then did the same for specific secondary indicators, and we first performed this analysis on a per indicator basis (Table 8), before repeating it on a more aggregated level whilst looking into the additional coverage of groups of specific secondary indicators as applicable to different Action Groups (Table 9). More precisely, not all specific secondary indicators are, by definition, relevant for all Action Groups. We therefore reviewed the specific secondary indicators per Action Group, according to an updated version of the findings of the First report on outcome indicators (see Table 1), by using the frequencies of these indicators from the survey data as reported in Section 4.2 of this report. We then tested whether coverage would increase if the resulting groups of indicators were considered within their respective Action Groups only. This analysis takes into account not only overlaps between the three groups of indicators we identified, but also potential overlaps between indicators from the same group (e.g. respondents that report both functional status and cognitive decline). In a final step, we repeated the above described analysis after briefly checking the limited information available to assess whether common secondary and specific secondary indicators may

be regarded as useful predictors of the outcome to be achieved within a particular intervention, as otherwise such indicators may not be appropriate for quantifying the interventions impact on the QoL goal and overall coverage may therefore be overestimated.

Table 7 below shows the additional coverage of each common secondary indicator per Action Group, for those respondents that do not report using any primary indicator. Whilst summary tables are provided here, more detailed 'Venn tables' for each specific indicator are presented in Annex 2 for relevant Action Groups.

Table 7 Additional respondents covered by individual common secondary indicators

Action Group	Total Number of responses to survey	Respondents covered by primary Indicators		Additional respondents covered by any risk factor		Additional respondents covered by physical Activity	
		N	%	N	%	N	%
A1	24	11	46%	3	13%	2	8%
A2	22	13	59%	4	18%	4	18%
A3	54	37	69%	4	7%	1	2%
B3	44	30	68%	4	9%	2	5%
C2	17	13	76%	0	0%	0	0%
D4	23	12	52%	2	9%	6	26%
All AGs	184	116	63%	17	9%	15	8%

Except for physical activity in Action Group D4, which 26% of additional respondents reported using, for all other Action Groups the percentage of respondents reporting risk factors or physical activity without using any primary indicator varies from 0% to 18%. At overall EIP on AHA level, less than 10% of respondents report using one of the common secondary indicators and no primary indicator. Table 8 below shows the additional coverage for each specific secondary indicator per Action Group, for those respondents that do not report using any primary or common secondary indicator.

Table 8: Additional respondents covered by individual specific secondary indicators

Action Group	Total Number of responses to survey	Respondents covered by primary Indicators		Additional respondents covered by any common secondary indicator		Additional respondents covered by adherence to treatment		Additional respondents covered by Frailty		Additional respondents covered by cognitive decline		Additional respondents covered by functional status		Additional respondents covered by falls	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
A1	24	11	46%	4	17%	4	17%	1	4%	0	0%	0	0%	0	0%
A2	22	13	59%	5	23%	0	0%	0	0%	0	0%	0	0%	4	18%
A3	54	37	69%	4	7%	2	4%	3	6%	3	6%	2	4%	1	2%
B3	44	30	68%	4	9%	0	0%	0	0%	0	0%	0	0%	0	0%
C2	17	13	76%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
D4	23	12	52%	6	26%	0	0%	0	0%	1	4%	1	4%	0	0%
All AGs	184	116	63%	23	13%	6	3%	4	2%	4	2%	3	2%	5	3%

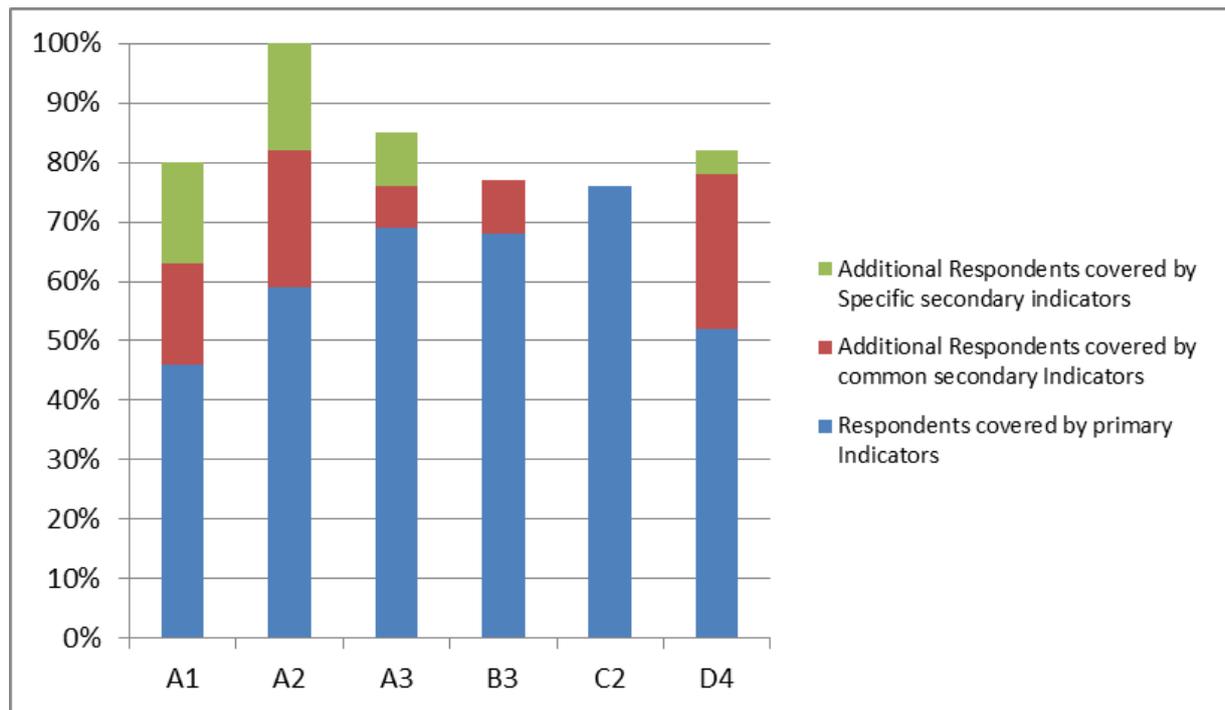
The proportion of respondents which reported using only specific secondary indicators is very low, ranging from 0% to 6%, except for adherence to treatment in Action Group A1, and falls in Action Group A2, which both show a higher value (17% and 18% respectively).

In the following step, we have considered groups of specific secondary indicators which are potentially applicable to each Action Group, instead of assessing them individually as reported in Table 8 above. As mentioned, as not all specific secondary indicators are deemed relevant for all Action Groups, we reviewed the data reported in the First report on outcome indicators (see Table 1 above) using the frequencies of specific secondary indicators from the survey data as reported in Section 4.2 of this report in order to assign specific secondary indicators to different Action Groups. As a result, the analysis reported in Table 9 and Figure 5 below takes into account any potential overlap between indicators provisionally proposed for MAFEIP. (In addition to what has been reported in Table 9, we also checked whether considering all specific secondary indicators within each Action Group would have improved coverage, but this resulted in only one additional respondent being covered in Action Group A3 through adherence).

Table 9: Respondents covered by type of indicators per Action Group

Action Group	Specific secondary indicators considered potentially relevant and tested within Action Group	Respondents covered by any indicator		Respondents covered by primary Indicators		Additional respondents covered by common secondary Indicators		Additional respondents covered by specific secondary indicators considered potentially relevant within Action Group	
		N	%	N	%	N	%	N	%
A1	Adherence	19	79%	11	46%	4	17%	4	17%
A2	Falls	22	100%	13	59%	5	23%	4	18%
A3	Functional status, Cognitive decline Frailty	46	85%	37	69%	4	7%	5	9%
B3	Functional status, adherence	34	77%	30	68%	4	9%	0	0%
C2	Functional status, Cognitive decline	13	76%	13	76%	0	0%	0	0%
D4	Functional status, Cognitive decline	19	83%	12	52%	6	26%	1	4%
All AGs		153	83%	116	63%	23	13%	14	8%

Figure 5: Respondents covered by each type of indicator per Action Group



Based on the survey data and without further considering whether secondary indicators are good predictors of the health outcome to be achieved for a particular respondent, the suggested choice of indicators would cover 83% of all respondents at EIP on AHA level. This coverage is mostly achieved through primary indicators (HRQoL and mortality, 63%) while the relevance of both common and specific secondary indicators, in terms of respondents covered by these types of indicators, is much lower (13% and 8% respectively). Whilst coverage through primary indicators is highest in Action Groups A3 (69%) and C2 (76%) only, overall coverage is lowest in Action Group C2 (76%). This is because no additional coverage has been achieved through common or specific secondary indicators in this Action Group. The lowest coverage through primary indicators was found in Action Groups A1 (46%) and D4 (52%). In both Action Groups, however, the percentage of additional respondents covered through common secondary indicators is high with 17% and 26% respectively. Across all Action Groups, the additional coverage reached through specific secondary indicators is low, with only adherence and falls sticking out with 17% and 18% in Action Groups A1 and A2 respectively.

One of the main conclusions to be drawn from the above analysis is that primary indicators cover more than half of all respondents in all but one Action Group (A1), while in three out of six Action Groups they cover between 68% and 76% of respondents, which is a very good result. Another point to be noted is that specific secondary indicators only cover 8% additional respondents overall, and only in two Action Groups do they cover between 17% and 18% additional respondents. Hence the added-value of capturing those types of indicators should be balanced against the resources required to develop more complex models for linking secondary indicators to the EIP on AHA objectives. Further work will be required to assess the feasibility of developing such models for secondary indicators and populating them with relevant data. It is important to note that this endeavour may not be feasible for all of the above listed candidates. Amongst other criteria, the existence of a respective model in the published literature may be a key requirement for assessing technical feasibility, as modelling the link between secondary indicators and the EIP on AHA health objective from scratch may not be a realistic option within the scope of MAFEIP. Further, issues of reliability may also arise when building different models to link from different surrogate endpoints

towards a common objective, and this should also be considered when deciding upon the addition of secondary indicators into the framework.

Further, it was mentioned above that a secondary indicator, though reported, may not be a good predictor of health outcome for a particular intervention delivered within a commitment, which would consequently result in an overestimation of coverage in the above analysis. As explained in the methods section, we therefore re-analysed coverage after briefly looking into the relationship between interventions delivered by a respondent and the type of secondary outcome indicators reported for those respondents that did not report primary indicators but the use of a relevant secondary indicator. This helped us account for some of the issues that may lower coverage through short-listed secondary indicators. To provide an example, if a respondent aims to reduce CHD-risk by increasing patient adherence to statins, risk factors (amongst them measures of blood cholesterol) may be regarded as highly relevant indicators that could be used to estimate the interventions impact on the likelihood of a future CHD-event and the subsequent impact on life expectancy and HRQoL. In contrast, if another intervention aims to improve symptoms of chronic back pain through a multimodal treatment concept, during which patients' blood pressure may be routinely taken, this risk factor may not adequately describe any treatment induced changes in patients' health status or perceived health related quality of life. Note, however, that because of the early stages of the project and the scarcity of information available, this assessment shall only be regarded as indicative, and future efforts will have to focus much deeper into the relationship between interventions and outcomes.

In order to re-analyse survey-responses in the above described manner, we looked into descriptions of interventions delivered within the EIP on AHA as they were provided by respondents to the survey. If it was concluded that an indicator should not be regarded as a good predictor of the outcome of interest, or it was not possible to make a decision from the limited data available, the respective respondent was considered not to be covered by this indicator. Table 10 and Figure 6 display the results of re-calculating coverage after considering the relationship between a respondent's intervention and the secondary outcome indicators reported.

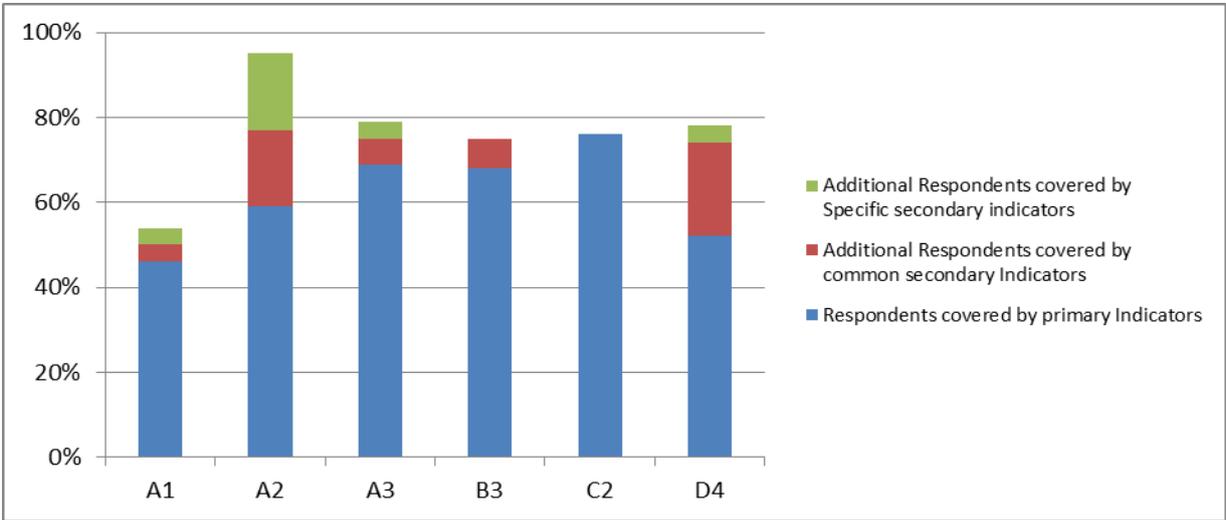
Table 10: Respondents covered by each type of indicator per Action Group – after briefly assessing the potential relationship between secondary indicators and interventions

Action Group	Specific secondary indicators considered potentially relevant and tested within Action Group	Respondents covered by any indicator		Respondents covered by primary Indicators		Additional respondents covered by common secondary Indicators		Additional respondents covered by specific secondary indicators considered potentially relevant within Action Group	
		N	%	N	%	N	%	N	%
A1	Adherence	13	54%	11	46%	1	4%	1	4%
A2	Falls	21	95%	13	59%	4	18%	4	18%
A3	Functional status, Cognitive decline Frailty	42	78%	37	69%	3	6%	2	4%
B3	Functional status, adherence	33	75%	30	68%	3	7%	0	0%
C2	Functional status, Cognitive decline	13	76%	13	76%	0	0%	0	0%
D4	Functional status, Cognitive decline	18	78%	12	52%	5	22%	1	4%
All AGs		140	76%	116	63%	16	9%	8	4%

From the 23 respondents which did not report primary indicators but common secondary indicators, we dropped 7 after a brief assessment of whether the common secondary indicator reported (or alternatively a secondary specific indicator) may be regarded as useful for modelling health impact of the respective intervention. For the 14 respondents reporting only specific secondary indicators, we dropped a further 6 for which specific secondary indicators seemed unsuitable for estimating the interventions' health outcome. This resulted in a total coverage of 76% across all respondents.

This analysis suggests that for 7 out of the 23 responses (30%) covered by common secondary indicators and for 6 out the 14 responses (43%) covered by specific secondary indicators the respective indicators would not support the modelling exercise given the aim/objective of the intervention whose outcome they seek to measure. This means that adding common secondary and specific secondary indicators to estimate overall impact on the EIP for AHA objectives would only increase coverage by 9% and 4% respectively instead of the 13% and 8% (at EIP on AHA level) shown in Table 9 above.

Figure 6: Respondents covered by each type of indicator per Action Group - after briefly assessing the potential relationship between secondary indicators and interventions



The above analysis resulted in a more conservative estimate of coverage through common and specific secondary indicators, whilst primary indicators were not affected. Primary indicators are, by definition, more generic and therefore more broadly applicable across commitments. However, there are other reasons which may also cause actual coverage through primary indicators to be lower than reported in Table 9, Table 10 and Figure 5 above as, for instance, not all instruments for estimating HRQoL can possibly be accounted for when modelling health impact of the EIP on AHA. The actual reduction in coverage would depend on the most common valuation methods for HRQoL used across commitments, the potential to map between them and, related to that, the availability of data to do so. We tried to account for some of these issues by looking into the use of particular methods for measuring HRQoL only, but unfortunately, information was only provided by a small subset of those respondents that use or intend to use HRQoL as a measure of health outcome. Nevertheless, in order to provide a more conservative estimate of coverage through primary indicators and particularly through measures of HRQoL, we performed the following additional analysis: first, we only considered respondents actually specifying the use of say EQ-5D or SF-36 questionnaires (as these were the most frequently reported tools which does not imply, however, that other tools should be a priori excluded); secondly, we assumed that none of the 65 out of 104 respondents (62.5%) that intend to use HRQoL but did not specify the respective tool yet would use either EQ-5D or SF-36, which is rather unlikely and in this context may therefore be regarded as a conservative assumption. As a result of this analysis, we find that overall coverage (primary and

secondary indicators) would remain almost constant, still reaching 75% across all Action Groups. Whilst coverage through primary indicators would obviously drop (to 42% overall), additional coverage through common and specific secondary indicators would increase to 25% and 9% respectively.

Hence, for the moment, we do not suggest entirely dropping any of these indicators from the framework, however, in the light of the analytic resources available to conceptualise, implement, populate and run models, we ought to consider the trade-off between the resources required for adding additional indicators to the framework, and the incremental increase in coverage that is likely to be achieved. Further work will be required to assess the feasibility of developing such models specifically for secondary indicators and populating them with relevant data. It is important to note that this endeavour may not be feasible for all of the above listed candidates. Amongst other criteria, the existence of a respective model in the published literature may be a key requirement for assessing technical feasibility, as modelling the link between secondary indicators and the EIP on AHA health objective from scratch may not be a realistic option within the scope of MAFEIP. Further, issues of reliability may also arise when building different models to link from different surrogate endpoints towards a common objective, and this should also be considered when deciding upon the addition of secondary indicators into the framework.

4.4 The special case of nutrition

In the First report on outcome indicators, we found that nutrition was mentioned by 12 commitments in good practices submitted in Action Group A3, which is why we thoroughly considered the inclusion of nutrition as an additional indicator for the quantitative assessment within MAFEIP. However, for several reasons we came to the conclusion in the First report on outcome indicators that nutrition requires further analysis before making a decision about whether to include or exclude this indicator. First, 'nutrition' has been very broadly defined in the initial framework and, just like health status or adverse drug effects, may therefore rather be regarded as an umbrella concept than an outcome indicator which is suitable for quantitative assessment. In terms of additional coverage achieved, however, the A3 data analysed in the First report on outcome indicators did show that, out of the 12 commitments that reported nutrition, almost half would not be covered by primary and common secondary indicators. Though considering specific secondary indicators could further reduce the relevance of nutrition for the framework, we decided to wait until survey data would become available before making a final decision regarding this indicator.

Hence, we conducted the analysis below to find out how many additional respondents may be covered if we considered the inclusion of the nutrition indicator. Table 11 provides a summary of both the frequency of this indicator across Action Groups as well as the additional coverage achieved after considering a) primary indicators only and b) primary and common secondary indicators for the quantitative assessment of impact within the QoL column of MAFEIP (note that we have not considered specific secondary indicators for this assessment, as in this case nutrition would not increase coverage at all). Further, we produced Venn tables per Action Group to provide a visual presentation of coverage through other indicators for those respondents that reported the use (or the intention to use) nutrition as an outcome indicator for MAFEIP.

Table 11: Frequency of and additional coverage achieved through the nutrition indicator

Action Group	Total Number of responses to survey	Respondents reporting nutrition		Additional respondents covered by nutrition (considering primary indicators only)		Additional respondents covered by nutrition (considering both primary and common secondary indicators, but not specific secondary indicators)	
		N	%	N	%	N	%
A1	24	7	29%	2	8%	1	4%
A2	22	14	64%	4	18%	0	0%
A3	54	33	61%	5	9%	2	4%
B3	44	16	36%	1	2%	0	0%
C2	17	2	12%	0	0%	0	0%
D4	23	7	30%	2	9%	0	0%
All AGs	184	79	43%	14	8%	3	2%

At EIP on AHA level, the nutrition indicator is reported by 79 (43%) of respondents, and this type of indicator has been mentioned most frequently in Action Groups A2 and A3 with 64% and 61% respectively. In all other Action Groups, its frequency is relatively low, ranging from 12% (C2) to 36% (B3).

When only considering initial coverage through primary indicators (i.e. not adding common or specific secondary indicators), the additional coverage achieved through the nutrition indicator is already quite low (8% across Action Groups), with only Action Group A2 reaching 18% additional coverage. Adding common secondary indicators (risk factors and physical activity) to the assessment would not increase coverage except for Action Groups A1 and A3. In each of these Action Groups, additional coverage would only reach 4%. Another reassuring fact is that risk factors have a larger overlap with nutrition than physical activity (see Table 12 to Table 17), which makes sense when considering that measures like, cholesterol levels, blood glucose levels or BMI are subsumed under the risk factor category; and these factors are all closely related to nutrition. Note again that the assessment does not even consider specific secondary indicators, which would further reduce additional coverage in those two Action Groups.

As mentioned above, in the light of the analytic resources available to conceptualise, implement, populate and run models, we ought to consider the trade-off between the resources required for adding additional indicators to the framework, and the incremental increase in coverage that is likely to be achieved. In the case of nutrition, this additional coverage appears to be negligible. This does by no means imply that nutrition changes do not have the potential to be substantial contributors to active and healthy ageing. It simply means that we ought to choose among a set of indicators that can all be used to extrapolate to the same health objective, and out of all the candidates available, it makes sense to choose those which offer the best ratio between resources spent to develop models and additional coverage reached.

In the tables below representing the overlaps between nutrition and other indicators, orange shaded cells indicate whether the use of an indicator has been reported by a commitment. If the commitment reported the use of nutrition but not the use of any primary or common secondary indicator, this has been highlighted by shading the relating cells with green and grey colour respectively.

Table 16: Overlap between nutrition and primary and common secondary indicators in Action Group C2

Nutrition	1	1
HRQoL	1	
Mortality	1	1
Any Risk factor	1	1
Physical Activity	1	1

As to Action Group C2, there are only two respondents reporting the use of nutrition as an indicator, for both there is an overlap with both primary and common secondary indicators.

Table 17: Overlap between nutrition and primary and common secondary indicators in Action Group D4

Nutrition	1	1	1	1	1	1	1
HRQoL	1		1	1		1	1
Mortality	1			1		1	
Any Risk factor	1	1	1			1	1
Physical Activity	1	1	1	1	1	1	1

Last but not least, for Action Group D4, the seven respondents that reported measuring nutrition also use primary or common secondary indicators. For two respondents there is an overlap with common secondary indicators only.

4.5 The special case of mental health, in particular depression

When analysing good-practices data in the First report on outcome indicators, we found that mental health, in particular depression was frequently mentioned especially by commitments in Action Group A3. As there was a considerable overlap with other HRQoL related instruments, however, at the time of writing the First report on outcome indicators, we decided to treat depression as a special case, analogously to nutrition, and to wait for the analysis of survey data before making a decision on the inclusion or exclusion of this indicator candidate. For the current analysis, we have therefore separated depression related instruments to provide HRQoL scores from other generic or disease specific HRQoL instruments as reported in Section 4.1 above. This allowed us to take a closer look into the potential benefits of including depression related indicators for the purposes of MAFEIP.

As a first step, we have collated a list of different depression-related instruments that have been reported by respondents to the survey to be used (or intended to be used) in order to provide HRQoL scores for depression and mental health related health states of their respective patients. Table 18: and Figure 7 provide an overview:

Table 18: Instruments reported to provide HRQoL scores for depression related health states

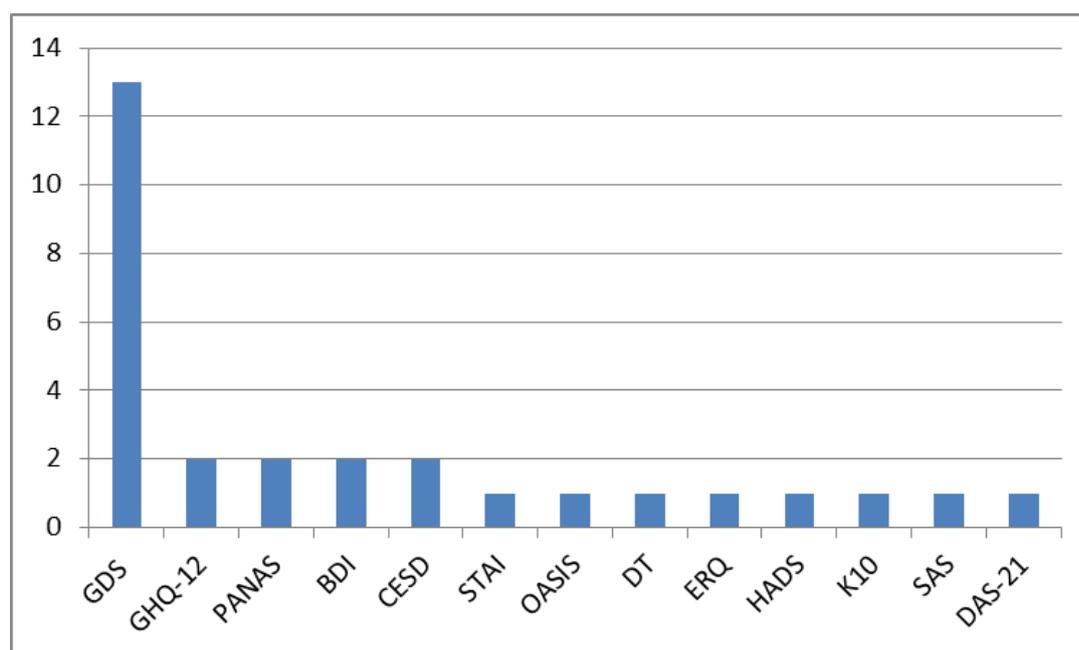
Nr of Respondents indicating collection of depression/mental health related data (N=27)		
HRQoL instrument further specified	22	81.5%
HRQoL instrument not specified	5	18.5%
Nr of Respondents specifying respective Mental health instrument (N=22) ^{1,2}		
Geriatric Depression Scale (GDS)	13	59%
General Health Questionnaire (GHQ)-12	2	9%
Positive and Negative Affect Scale (PANAS)	2	9%
Beck depression inventory (BDI)	2	9%
Center for Epidemiologic Studies Depression Scale (CESD)	2	9%
The State-Trait Anxiety Inventory (STAI)	1	5%
Overall Anxiety Severity and Impairment Scale (OASIS)	1	5%
Distress thermometer (dt)	1	5%
Emotion Regulation Questionnaire (ERQ)	1	5%
Hospital Anxiety and Depression Scale (HADS)	1	5%
Kessler Psychological Distress Scale (K10)	1	5%
Zung Self-Rating Anxiety Scale (SAS)	1	5%
Depression Anxiety & Stress Scale (DAS-21)	1	5%

¹ Percentages of the different instruments/questionnaires reported add to more than 100% as some respondents reported the use of more than one instrument-

² Instruments to measure well-being and self-esteem were not considered as they do not assess mental health status

In total, 27 respondents indicated to collect information on depression / mental health, of which 22 respondents further specified using one or more of the above mentioned instruments. By far the most prevalent tool was the Geriatric Depression Scale (GDS), mentioned by 13 respondents, followed by the General Health Questionnaire (GHQ) with 3 respondents mentioning the respective instrument. All other instruments were only mentioned by one or two respondents to the survey.

Figure 7: Instruments reported to provide HRQoL-scores for depression related health states



In a second step, we conducted the same analysis as for nutrition reported in Section 4.4 above in order to find out how many additional respondents may be covered if we considered the inclusion of depression as an indicator. Table 19 provides a summary of both the frequency of the depression indicator across Action Groups as well as the additional coverage achieved after considering a) primary indicators only and b) primary and common secondary indicators for the quantitative assessment of impact within the QoL column of MAFEIP. As before with nutrition, we have ignored other specific secondary indicators in this analysis as they would have lowered additional coverage achieved through depression even further.

Table 19: Frequency of and additional coverage achieved through instruments reported to provide HRQoL-scores for depression-related health states

Action Group	Total Number of responses to survey	Respondents reporting depression/mental health		Additional respondents covered by depression/mental health (considering primary indicators only)		Additional respondents covered by depression/mental health (considering both primary and common secondary indicators, but not specific secondary indicators)	
		N	%	N	%	N	%
A1	24	2	8%	1	4%	0	0%
A2	22	1	5%	0	0%	0	0%
A3	54	16	30%	2	4%	1	2%
B3	44	4	9%	0	0%	0	0%
C2	17	1	6%	1	6%	1	6%
D4	23	3	13%	1	4%	0	0%
All AGs	184	27	15%	5	3%	2	1%

In accordance with the analysis of good practices data in the First report on outcome indicators, we found the highest frequency of respondents reporting the use of a depression-related instrument in Action Group A3. 16 respondents (30% of respondents within this Action Group) reported using, or having the intention to use an instrument to provide HRQoL-scores for depression-related health states. In all other Action Groups, frequencies remained low, with 5% (Action Group A2) to 13% (Action Group D4) of respondents mentioning this indicator. When looking at the additional coverage achieved after considering primary indicators first, the relevance of depression-related instruments diminishes even in Action Group A3, with only 2 additional respondents (4%) that would be covered through the depression indicator in this group. Overall, additional coverage achieved would not exceed 3% (5 respondents). When adding common secondary indicators, the inclusion of depression would only result in two additional respondents (1%) being covered across all Action Groups.

As with the nutrition indicator above, we also produced Venn tables per Action Group to provide a visual presentation of coverage through other indicators for those respondents that reported using (or having the intention to use) depression as an outcome indicator for MAFEIP. However, as the frequency of the depression indicator was low in all but Action Group A3, we only display the Venn table for this particular Action group here. Again, orange shaded cells indicate whether the use of an indicator has been reported by a commitment. Only one commitment (highlighted in green in Table 20) reports the use of a depression related instrument but no primary or common secondary indicator.

Table 20: Overlap between depression and primary and common secondary indicators in Action Group A3

Depression/Mental Health	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HRQoL	1	1			1	1	1	1		1	1	1		1	1	1
Mortality			1		1	1			1	1			1		1	
Any Risk factor	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
Physical Activity		1			1	1			1	1		1	1	1	1	1

The above analysis shows that additional coverage through the inclusion of depression-related indicators within MAFEIP is likely to be low. However, information obtained from instruments to provide depression specific HRQoL scores could still prove useful and may be incorporated into the framework via mapping algorithms to convert scores obtained with one instrument into equivalent scores of another instrument. For instance, the EQ-5D, which is a generic and preference-based instrument to value HRQoL, contains one dimension that is concerned with anxiety and depression and, as already mentioned above, there are a number of mapping algorithms available which may allow the conversion of scores obtained from different generic and disease-specific instruments towards the EQ-5D [e.g. Longworth et al., 2014; Longworth & Rowen, 2013; Dakin, 2013]. Hence, in order to increase the generalisability of the monitoring framework for the EIP on AHA, we propose either calculating or adapting existing algorithms that are published in the scientific literature to 'convert' depression-specific HRQoL-scores into equivalent values of the EQ-5D instrument. Although we are not yet able to determine for which depression-specific instruments this may be a feasible option, experts on this matter have already been contacted and further research will be conducted on this issue.

5. Survey data analysis: Sustainability of health and care systems

As discussed in the First report on outcome indicators, we propose collecting information on the change in quantities of resources used as our primary focus of analysis for assessing the EIP on AHA impact on the sustainability of health and care systems. We will also, however, summarise survey data with respect to patient / user satisfaction, as this potential indicator was mentioned frequently across Action Groups in the First report on outcome indicators.

5.1 Resource use items reported by survey participants

In general, we believe that commitments should be encouraged to report resource use data on any item they regard as relevant in relation to their intervention, while collecting information on health and care cost / expenditures may pose further restrictions on the ability of transferring or extrapolating information from individual commitments to other settings or to a health/care system level. The main reason is that relative prices may differ substantially between settings, so that an identical change in resource utilisation in two settings may translate into different impact on respective health and care expenditures. In addition, unit costs of resources are also likely to change over time within the same setting, which may impact on respective health and care expenditures even if utilisation remains constant. Therefore, whilst resource use data should be collected from EIP on AHA participants, we propose collecting information on unit cost for resources via desk research unless such data can be provided by commitments.

Unlike the QoL column, however, where the basic idea is to estimate health impact with one indicator that best describes the outcome achieved by an intervention delivered within a particular commitment, different resource use items may be affected simultaneously by the same intervention delivered within a commitment. As resource use items cannot be seen as complementary indicators of impact, this requires a different approach to the analysis of the survey data. For instance, reducing hospitalisation could come at the cost of an increased number of primary care visits, which should be taken into account when assessing an interventions' impact on the sustainability of health and care systems. Rather than assessing overall coverage, we have therefore looked into the most common types of resources reported by respondents (i.e. frequencies) in order to obtain an indication about the type of resource use data which may be most common within and across Action Groups.

In order to reduce the administrative burden on respondents to fill in the questionnaire, it was decided to structure it in a way that both pre-defined categories of major resource use items and free-text questions to specify 'other resource use' were available. Pre-defined categories were based on frequently mentioned resource use items from previous analyses. Though this did help to reduce the time required to fill in the questionnaire, it needs to be stated that respondents may be less likely to answer to free-text questions than to tick boxes for pre-defined categories. Hence, when interpreting the data, it is important to keep in mind that 'other resource use-items' may be under-reported, and that their relevance for MAFEIP may be higher in practice.

The number of respondents reporting information on health and care resource indicators is provided in Table 21. Frequencies are provided for five pre-defined types of health and care resources:

- Hospital (re)admissions
- Length of hospital stay
- Hospital visits
- Institutionalisation data (e.g. proportion of target group living at home; avoided institutionalisation; length of stay in elderly homes etc.)
- Other health and care resources.

As mentioned, the survey allowed participants to further specify "other care resources" affected and the respective responses are analysed in Table 22 below. In total 90 out of the 184 respondents

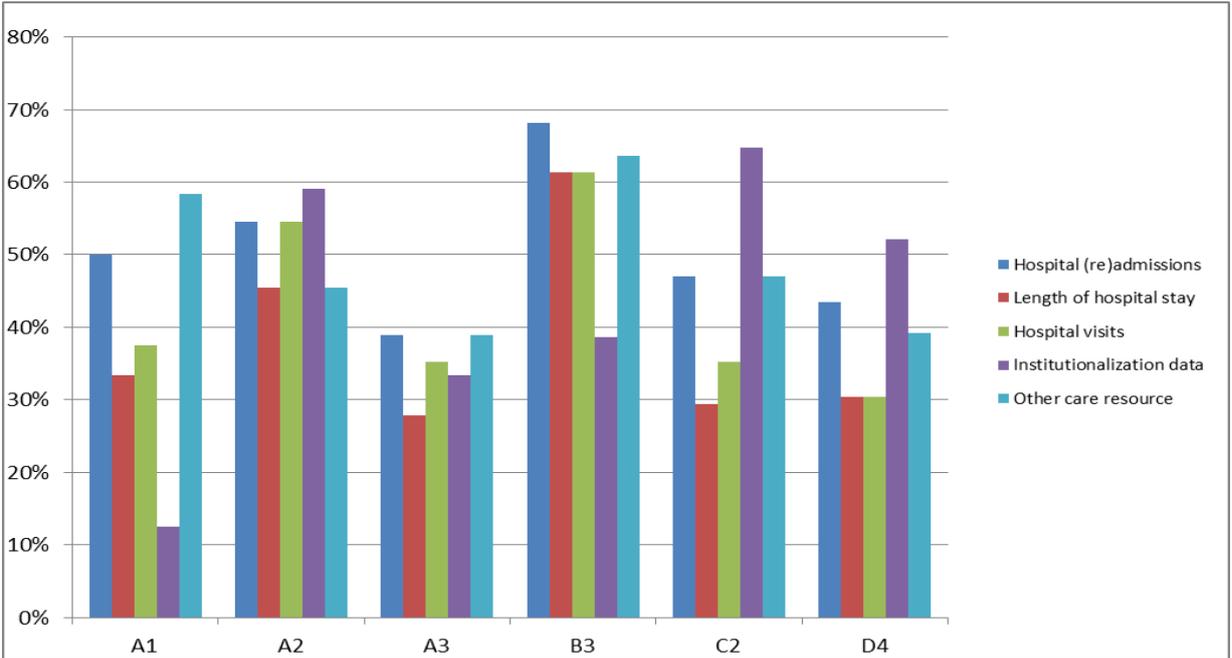
(49%) have mentioned that other resource use items than the pre-defined categories are relevant to them. This other resource use has been specified further by 37 of those 90 respondents.

Table 21: Frequency of types of resources reported

Action Group	Total Nr of Responses to survey	Hospital (re)admissions		Length of hospital stay		Hospital visits		Institutionalisation		Other care resource	
		N	%	N	N	N	N	N	%	N	%
A1	24	12	50%	8	33%	9	38%	3	13%	14	58%
A2	22	12	55%	10	45%	12	55%	13	59%	10	45%
A3	54	21	39%	15	28%	19	35%	18	33%	21	39%
B3	44	30	68%	27	61%	27	61%	17	39%	28	64%
C2	17	8	47%	5	29%	6	35%	11	65%	8	47%
D4	23	10	43%	7	30%	7	30%	12	52%	9	39%
All AGs	184	93	51%	72	39%	80	43%	74	40%	90	49%

At EIP on AHA level, the resource indicator reported more frequently is hospital (re)admissions with 51% of respondents providing information and stating that they are currently collecting this type of information, or that it will be collected in the future. Overall, the indicators hospital visits (43%), length of hospital stay (39%) and institutionalisation (40%) are somewhat less frequently reported. There is however significant variability between Action Groups for all the resource indicators considered. For instance, 68% of respondents from Action Group B3 report hospital (re)admissions while 39% do so in Action Group A3. The indicator institutionalisation is frequently reported by A2, C2 and D4 (59%, 65% and 52% respectively). Nevertheless, for most of the resources indicators and Action Groups, the frequencies found are around 40% and higher, which can also be seen in Figure 8.

Figure 8: Frequency of types of resources reported



For "other" health and care resources, which was mentioned by 90 respondents (49% of survey participants), 37 (41%) provided further details on which other resources they considered. As shown in Table 22, "emergency services" (35%) and "primary care visits" (16%) were those more frequently reported, whilst frequencies for all other types of resources reported were lower.

Table 22: "Other" resource use

Nr of Respondents indicating 'other' resource use (N=90)								
	A1	A2	A3	B3	C2	D4	All	%
'Other' resource use not further specified	6	7	15	11	6	8	53	59%
"Other" resource use further specified	8	3	6	17	2	1	37	41%
'Other' resource use further specified (all respondents)								
Emergency services						13	35%	
Primary care visits						6	16%	
Specialists visits						4	11%	
Referrals between primary and hospital care						4	11%	
Clinical tests						2	5%	
Nurse visits						2	5%	
Test strips and other auto diagnostic materials						2	5%	
Home visits						2	5%	
Other type of healthcare resource						14	38%	

*Percentages may add to more than 100% as respondents could report more than one affected resource use item.

In conclusion, the survey data provides limited insight into what other types of resource use items we may have to collect data on in future in order to populate models for the assessment of the sustainability of health and care systems. Future deliverables may have to provide more detail with respect to the type and format of data we would require to monitor EIP on AHA outcomes in that column. This will depend on a further specification of the modelling approach proposed for MAFEIP, which is the objective of the upcoming MAFEIP report on a conceptual description of the monitoring framework.

5.2 Patient / user satisfaction

Apart from resource use items as reported in Section 5.1 above, one indicator, namely patient / user satisfaction, received particularly strong support, both through the analysis of good practices data in the First report on outcome indicators and in the survey on potential outcome indicators for MAFEIP. Precisely, patient / user satisfaction was mentioned 13 times in good practices submitted in Action Group A1, 15 times in A3, 11 times in B3, and 10 times in Action Group D4 respectively. Within the survey on outcome indicators, patient / user satisfaction was also reported by 46% of respondents across Action Groups, with strongest support in Action Groups C2 (71% of respondents), B3 (61%) and A2 (55%) respectively (Table 23).

Table 23: Frequency of patient/user satisfaction across Action Groups

Action Group	Total Nr of responses to survey	Respondents reporting patient / user satisfaction	
		Frequency	in percent
A1	24	12	50%
A2	22	12	55%
A3	54	17	31%
B3	44	27	61%
C2	17	12	71%
D4	23	5	22%
All AGs	184	85	46%

It may not be feasible to establish a quantitative link between patient / user satisfaction and the sustainability of health and care systems (in terms of EIP on AHA impact on health and care resources) within the scope of the modelling exercise for MAFEIP. Nevertheless, the strong support for patient / user satisfaction from both good practices and survey responses shows the high relevance of patient / user satisfaction for successful implementation of technological and social innovation in the health and care domain. Hence, given its strong support across Action Groups, it may be worthwhile to consider this indicator for complementary research alongside our quantitative modelling proposal, whilst bearing in mind the analytic resources that would be required for carrying out such work.

6. Discussion of results

The analysis of the survey data on outcome indicators answered by 184 respondents confirms and strengthens a number of findings already presented in the First report on outcome indicators as to the adequacy of indicators for modelling the outcomes of the EIP on AHA on the 2HLYs and the Triple Win. The analysis presented in this report allows us to refine our modelling plans.

First of all, the analysis of the survey data shows that, regarding the 'QoL' column, the primary and common secondary indicators selected in the First report on outcome indicators cover 76% of all respondents to the survey. This result confirms their general ability to capture a majority of commitments within MAFEIP. However, common secondary indicators only add 13% coverage to the primary indicators that on their own cover 63% of respondents. After analysing the type of intervention, we found that additional coverage through common secondary indicators would even decrease to 9%. In other words, the biggest coverage is by large provided through the two primary indicators HRQoL and mortality. As these indicators are more generic and therefore more applicable across intervention areas, this result confirms a priori expectations, and as they are particularly well suited for Decision Analytic Modelling of health outcomes, they fully support our modelling proposal for MAFEIP. Further, in the First report on outcome indicators, we considered the inclusion of common secondary and specific secondary indicators to provide a solution should we not find enough support for primary indicators. As this support was overwhelming in the survey, the question may rather be whether analytic resources should focus on adapting models to all interventions delivered by commitments that report primary indicator data, rather than on developing more complex models for secondary indicators in order to increase coverage.

The survey data makes this point even stronger with regard to specific secondary indicators whose added-value in terms of coverage is even lower. For cognitive decline, functional status and frailty it oscillates between 0% and 6% in all Action Groups. For adherence (Action Group A1) and falls (Action Group A2) this is 17% and 18% respectively. However, if we take into account the link between secondary indicators and the respective interventions delivered by respondents, adherence also has a low additional coverage (4%). Only in Action Group A2, falls sustained their relevance in terms of additional coverage of four respondents (18%). This shows that, apart from falls for Action Group A2, systematically collecting data on specific secondary indicators may not add considerable value in terms of additional coverage and hence for assessing the overall impact on the EIP on AHA health objective.

Nutrition, which we have handled as a special case in the First report on outcome indicators, has been reported by 43% of respondents to the survey, with highest frequencies recorded in Action Groups A2 (64%) and A3 (61%). However, even if we considered primary indicators only (HRQoL and mortality), adding nutrition would increase coverage by no more than 8%. When considering primary and common secondary indicators, of which risk factors played a more substantial role probably as they include aspects of nutritional impact such as BMI, cholesterol levels and blood glucose, adding nutrition does not really increase coverage, with only one additional respondent covered in Action Group A1, and 2 additional respondents in Action Group A3 respectively. Note that this assessment does not even include specific secondary indicators originally proposed, in which case additional coverage would probably be zero. This does by no means imply that nutrition changes do not have the potential to be substantial contributors to active and healthy ageing. It simply means that we ought to choose among a set of indicators that can all be used to extrapolate to the same health objective, and out of all the candidates available, we ought to choose those which offer the best ratio between resources spent to develop and implement models and additional coverage likely to be achieved.

The picture that emerged for instruments providing HRQoL-scores for depression related health states was very similar, with only 1% of additional respondents being covered when considering both primary and common secondary indicators first. However, information obtained from instruments to provide scores for depression-related HRQoL could still prove useful and may be incorporated into the framework via mapping algorithms to convert scores obtained with one instrument into equivalent scores of another instrument. Although we are not yet able to determine for which depression-specific instruments this may be a feasible option, IPTS is already in contact with experts on this matter and will conduct further research into this issue.

All this leads us to reconsider the added-value not only of nutrition and depression, but also specific and common secondary indicators. While in the First report on outcome indicators we considered secondary indicators as essential, we suggest here to assess carefully the added-value of including them before making a decision on modelling. Indeed adding any single indicator implies collecting data on a number of variables for which significant resources are required. Further work will also be required to assess the feasibility of developing such models for secondary indicators. It is important to note that this endeavour may not be feasible for all of the above listed candidates. Amongst other criteria, the existence of a respective model in the published literature may be a key requirement to assess technical feasibility, as modelling the link between secondary indicators and the EIP on AHA health objective from scratch may not be a realistic option within the scope of MAFEIP. Further, issues of reliability may also arise when building different models to link from different surrogate endpoints towards a common objective, and this should also be considered when deciding upon the addition of secondary indicators into the framework. Finally, as analytic resources available to conceptualise, implement, populate and run models are not infinite, we ought to consider the trade-off between the resources required for adding additional indicators to the framework, and the incremental increase in coverage that is likely to be achieved. This does not preclude that some information related to secondary indicators (if available) might be helpful to populate models for extrapolating interventions' impact on primary indicators (HRQoL and mortality) e.g. to estimate transition probabilities between health states. However, the systematic collection of secondary indicator data may only be decided upon for the development of additional models to link between those indicators and the EIP on AHA health objective in the absence of primary indicator data, which should be considered with caution. The modelling strategy for MAFEIP will be discussed much more thoroughly in the upcoming MAFEIP report on a conceptual description of the monitoring framework.

Regarding the column 'sustainability of health and care systems', survey data shows that many respondents report data on hospital admissions in Action Groups A1, A2, B3 and C2 and on institutionalisation in Action Group A2, C2 and D4. Hospital visits and the length of stay are less frequently reported in most Action Groups (apart from A2 and B3). However, the survey data provides a limited picture on what other types of resource use items we may have to collect data on in future in order to populate models for the assessment of the sustainability of health and care systems. Finally, it may not be feasible to establish a quantitative link between patient / user satisfaction and the sustainability of health and care systems (in terms of EIP on AHA impact on available health and care resources within the scope of the quantitative modelling exercise for MAFEIP. However, it may be worthwhile to consider this indicator for complementary research alongside our quantitative modelling proposal, whilst bearing in mind the analytic resources that would be required for carrying out such work.

7. Conclusions

The analysis of the survey data on outcome indicators confirms and strengthens a number of findings presented in the First report on outcome indicators as to the adequacy of primary indicators for modelling the outcomes of the EIP on AHA on the 2HLYs and the Triple Win. It also shows that a careful choice needs to be made with respect to adding common and specific secondary indicators to the framework, as this may have potentially limited benefits. As substantial amounts of data need to be gathered either directly from commitments and/or from national/regional statistics, the scientific literature etc., the resources required to populate additional models increase significantly.

In any event, based on the analysis of the survey data, we can draw the following conclusions:

"Must" indicators for modelling in MAFEIP:

'Sustainability of health and care systems' column

- Resource use

'Quality of Life' column:

- Health related Quality of Life
- Mortality

Indicators subject to an assessment of technical feasibility, resource availability within MAFEIP, and additional coverage likely to be achieved:

- Risk factors
- Physical Activity
- Falls
- Adherence

If mapping is a feasible option, scores obtained from depression-specific instruments may be converted into equivalent scores of a more generic measure of HRQoL, such as the EQ-5D instrument. All other indicators namely frailty, cognitive decline, functional decline and nutrition are not excluded at this stage, however their inclusion in a future modelling framework should also be subject to the gathering of additional evidence as well as to the availability of resources and the technical feasibility to develop quantitative models. This does not preclude that some information related to secondary indicators (if available) can be helpful to populate models for extrapolating interventions' impact on primary indicators (HRQoL and mortality) e.g. to estimate transition probabilities between health states. However, the systematic collection of secondary indicator data may only be decided upon for the development of additional models to link between those indicators and the EIP on AHA health objective in the absence of primary indicator data, which should be considered with caution. Hence, the indicators discussed here still constitute a long list of potential candidates for the purposes of linking outcomes towards the EIP on AHA objectives, and as further evidence within MAFEIP becomes available, this long list of candidates may be further refined in the future.

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9. Annexes

Annex 1: Outcome questionnaire

Part 0: Privacy statement

I have read and accepted the privacy statement (see attachment) Yes/No

Part 1: General part: Questionnaire outcome indicators

Name of the organisation.....

Name of the commitment.....

Acronym of the commitment.....

The commitment is submitted to the following Action Groups.....

1. Short description of the intervention

Example: After a fall incident, the physiotherapist and the dietician make an integrated health plan. In this health plan there is an emphasis on the self-management of the patient. Each day the patient should count the calories and move at least 30 minutes. The patient has a device to send this information to the physiotherapist and the dietician. The technology used is an open platform. (±300 words)

.....
.....
.....
.....

2. Please give a description of your target group and main characteristics (e.g. sex, age, cardiac disease, frail problems, balance problems, polypharmacy)

Example: all **female** patients above **70** visiting physiotherapy in the city of Madrid having a **balance problem** after a **fall incident**. (±150 words)

.....
.....

3. Does your commitment affect (or impact) the delivery of care and do/did you use a business model? If yes, please describe this influence and /or the business model.

Example: As a result of the intervention, the regular hospital visits went down; there were less hospital admissions and less 'new' fall incidents. We didn't use a business model. (±150 words)

.....
.....
.....
.....

4. Evidence: are you registering any evidence? If yes, please give a brief description of the followed methodology.

Example: The methodology of this study is to **compare** the visits (hospital and general practitioner), hospitalisation and 'new' fall incidents **with and without treatment by physiotherapist and a dietician** after a fall incident. (±200 words)

.....
.....
.....
.....

5. Indicators you are registering

5.1 Which indicators do you register in your commitment?

Please fill in the table if you are registering or planning to register information regarding the following issues. If you are registering or planning to register information we would also like to ask you to fill in the attached excel-file with more specific information regarding the indicators you are registering (or planning to register).

	Do you register, or are you planning to register information about	Yes	No	Planned
Nutrition	the (mal)nutrition, vitamin D consumption or other nutrition information of your target group?			
Physical activity	the physical activity of your target group, e.g. physical activity in the last 7 days, lifestyle, muscle strength, gait balance, Activities of Daily Living (ADL), self-sufficiency?			
Prevention and identification: risk and preventative factors	the adherence level of your target group?			
	the blood pressure of your target group?			
	the cholesterol level of your target group?			
	the glucose level of your target group?			
	the Body Mass Index (BMI) of your target group?			
Health status	other risk factors and preventative factors of your target group e.g. abnormal lipid metabolism, persistence level (length of time between first and last dose of medication)?			
	(self-assessed) health status of your target group?			
	the Quality of Life, mental well-being, ... of your target group?			
	frailty index within your target group?			
	cognitive function within your target group?			
functional capacity within your target group?				
Participation in society	voluntary work, social isolation, supportive relationships, social contacts, lack of participation due to physical barriers,...?			
Mortality and injuries	the number of people in your target group that died because of a chronic disease?			
	the number of people in your target group that had a fall incident or died because of a fall incident or...?			
Use of health and care services, such as information regarding hospitalisation	the hospital (re-)admissions of your target group?			
	the average length of stay in your target group, the bed days?			
	the number of hospital visits			
	other type of consumption of health and care services?			
Management of health and care services	the costs of health and care expenditures of your target group?			
	the costs of the drug use of your target group			
	the costs of hospitalisation			
	other costs /resource use (e.g. costs of home visits, costs of general practitioner visits)			
	patient satisfaction within your target group?			
	appropriateness of prescription?			
	adverse effects of prescription?			
	the use of drugs by patients?			
training and education of health and care professionals or informal carers, patients and their family : e.g. number of training courses, number of participants?				
Care at home and institutionalisation	Proportion of your target group living at home, avoided institutionalisation, level of institutionalisation,...?			
Innovation	the implemented technology and devices, e.g. number of users; number of implemented apps, games, number of patients/older citizens receiving telehealth/telecare,...?			
Employment and growth	employment, e.g. the number of jobs created, number of companies created, growth of companies, ...			

5.2 Are you registering other outcome indicators? If yes, please mention them below.

.....
.....
.....
.....

Part 2: Detailed information: Questionnaire outcome indicators

Please fill in this part of the questionnaire if you are registering or planning to register outcome indicators to measure the impact of your commitment.

Please, indicate in the table below in each row for each indicator: the description of the indicator, what you measure, how you are measuring, the target, the year in which you hope to achieve your target, the starting year, the value in the starting year, the current value. Please be as precise as possible in the description of the target, the value in the starting year and the current value. If possible please **include detailed information about the sample and its size**, see the example below.

Example: Row indicator 'blood pressure'

Blood pressure	
1. Description of the indicator	% of cardiac patients with systolic blood pressure below 140 mm Hg
2. What do you measure?	The blood pressure of all cardiac patients treated in hospital X
3. How are you measuring?	Each time a cardiac patient visit the hospital his blood pressure is measured
4. What is your target?	Target: 50% of the cardiac patients in hospital X with systolic blood pressure below 140 mm Hg
5. In which year do you hope to achieve your target?	2015 (December)
6. What is the starting year?	2012 (July)
7. What is/was the value in the starting year? Please include a description of the sample and its size.	25% of the 400 cardiac patients in hospital X with systolic blood pressure below 140 mm Hg in July 2012.
8. What is the current value? Please include a description of the sample and its size.	40% of 450 cardiac patients in hospital X with systolic blood pressure below 140 mm Hg in December 2013.

	Description of the indicator	What do you measure	How are you measuring	What is your target	Year of target	Starting year	Value in starting year (incl. sample information)	Value 2013 (incl. sample information)
Nutrition: e.g. the (mal)nutrition, vitamin D consumption,...								
Indicator nutrition 1								
Indicator nutrition 2								
...								
Physical activity: e.g. physical activity in the last 7 days, lifestyle, muscle strength, gait balance, ADL, self-sufficiency,...								
Indicator physical activity 1								
Indicator physical activity 2								
...								
Prevention and identification of risk and preventative factors: e.g. adherence level, blood pressure, cholesterol level, glucose level, BMI,...								
Indicator preventative factors 1								
Indicator preventative factors 2								
...								
Health status: e.g. self-assessed health status, QoL, mental well-being, frailty index, cognitive function, functional capacity,...								
Indicator 1 health status								
Indicator 2 health status								
...								

Participation in society: e.g. voluntary work, social isolation, supportive relationships, social contacts, lack of participation due to physical barriers,...								
Indicator participation in society 1								
Indicator participation in society 2								
...								
Mortality and injuries: e.g. the number of people who died because of a chronic disease, of a fall incident,...								
Indicator mortality and injuries 1								
Indicator mortality and injuries 2								
...								
Use of health and care services, such as hospitalisation: e.g. hospital (re-) admissions, length of stay, bed days, number of hospital visits...								
Indicator consumption of health and care services 1								
Indicator consumption of health and care services 2								
...								
Management of health and care services: e.g. costs or health care expenditures in general or more specific like costs of drugs, hospitalisation, home visits, patient satisfaction, appropriateness of prescription, adverse effects of prescription, use of drugs, training and education (number of training courses, number of participants),...								
Indicator management of health and care services 1								
Indicator management of health and care services 2								
...								

Care at home and living in institutions: e.g. proportion of your target group living at home, avoided institutionalisation, institutionalisation,...								
Indicator care at home and living in institutions 1								
Indicator care at home and living in institutions 2								
...								
Innovation: Implemented technology and devices: e.g. number of users; number of implemented apps, games, number of patients/older citizens receiving telehealth/telecare; number of patients receiving care remotely; number of patients using internet								
Indicator innovation1								
Indicator innovation 2								
...								
Employment and growth: e.g. the number of jobs created, number of companies created, growth of companies, ...								
Indicator employment 1								
Indicator employment 2								
...								
Other indicators								
Indicator 1								
indicator 2								
...								

- **Physical activity**

Table 28 to **Table 30** below show the overlap between physical activity and primary indicators by respondent for Action Groups A2, A3, C2 and D4, which are those for which physical activity has been reported most frequently.

Table 27: Overlap between physical activity and primary indicators in Action Group A2

Physical Activity	1	1	1	1	1	1	1	1	1	1	1	1		
HRQoL	1	1		1			1	1	1	1	1	1		
Mortality	1	1		1				1	1			1	1	

For Action Group A2, out of the 13 commitments which reported the use of physical activity, seven report both HRQoL and mortality, while another two report HRQoL. Four commitments do not report any of the two primary indicators.

Table 28: Overlap between physical activity and primary indicators in Action Group A3

Physical Activity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HRQoL	1	1	1	1	1	1	1			1	1	1	1		1	1	1	1	1		1	1		1	1	1
Mortality	1	1			1	1	1	1	1	1	1	1	1	1			1	1	1	1					1	

For Action Group A3, out of the 26 respondents that report measuring physical activity, only one shows no overlap with and hence no coverage by primary indicators. In addition, only four further respondents do not report using HRQoL. This means that nearly all respondents in this Action Group are covered by the HRQoL indicator and most are covered by both HRQoL and Mortality.

Table 29: Overlap between physical activity and primary indicators in Action Group C2

Physical Activity	1	1	1	1	1	1	1	1	1	1	1	1
HRQoL	1	1	1	1	1	1	1	1	1	1		
Mortality					1			1			1	1

As to Action Group C2, only 10 respondents in total report measuring physical activity, and all also use primary indicators. 9 of these report HRQoL and the 10th reports mortality data.

Table 30: Overlap between physical activity and primary indicators in Action Group D4

Physical Activity	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HRQoL		1				1	1			1			1	1
Mortality		1							1	1			1	

Finally, for Action Group D4, Physical activity is being measured by 14 respondents in total, out of which 6 show no overlap with either of the primary indicators.

2) Specific secondary indicators

This section focuses on overlaps between specific secondary indicators on the one hand, and primary indicators as well as common secondary indicators on the other, at Action Group level.

- **Adherence to treatment**

Table 31 and **Table 32** show the overlaps between adherence to treatment and primary/common secondary indicators by respondent for Action Groups A1 and A2, which are those which report measuring adherence to treatment relatively most frequently.

Table 31: Overlap between adherence to treatment and primary and common secondary indicators in Action Group A1

Adherence to treatment	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HRQoL	1	1	1		1	1	1			1	1	1				
Mortality					1	1	1			1		1			1	
Any Risk Factor	1	1			1	1		1				1			1	1
Physical Activity	1				1	1		1			1					

For Action Group A1, out of 16 respondents which report measuring adherence to treatment, 4 do not show any overlap with primary or secondary common indicators.

Table 32: Overlap between adherence to treatment and primary and common secondary indicators in Action Group A2

Adherence to treatment	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HRQoL	1	1	1	1	1			1	1	1	1	1	1	1	1
Mortality	1	1		1	1					1	1			1	1
Any Risk Factor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Physical Activity	1	1		1		1			1	1	1	1	1	1	1

As to Action Group A2, out of 14 respondents which report measuring adherence to treatment, all respondents show overlap with primary indicators or common secondary indicators. If one considered overlaps between this indicator and primary indicators only, 2 commitments would not show any overlap which is still relatively low.

- **Frailty**

Table 33 below shows the overlap between these indicators by respondent for Action Group A3, which is the Action Group reporting measuring frailty relatively most frequently.

Table 33: Overlap between frailty and primary and common secondary indicators in Action Group A3

Frailty	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HRQoL	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1		1		1
Mortality		1	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1					1	1	
Any Risk Factor	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1
Physical Activity	1	1		1	1	1	1		1	1	1	1	1	1	1	1	1	1	1					1	1	

Table 40: Overlap between functional status and primary and common secondary indicators in Action Group D4

Functional status	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HRQoL	1	1		1		1	1	1		1	1	1						
Mortality	1	1	1															1
Any Risk Factor	1	1		1													1	
Physical Activity	1	1	1	1	1											1	1	1

Finally for Action Group D4, only 1 out of 12 respondents which report measuring functional decline show no overlap with primary or common secondary indicators. All of the remaining 11 respondents show overlap with at least one primary indicator and seven show overlaps with both primary and common secondary indicators.

- Falls**

There are 5 respondents (3%) that report measuring the specific secondary indicator "falls" but do not collect nor plan to collect primary or common secondary indicators in the future. **Table 41** shows the overlap between these indicators by respondent for Action Group A2, which is the only Action Group where the falls indicator is reported relatively frequently.

Table 41: Overlap between falls and primary and common secondary indicators in Action Group A2

Falls	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HRQoL	1	1		1	1	1	1	1	1	1		1		1					
Mortality	1	1			1	1	1	1						1					
Any Risk Factor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Physical Activity	1	1	1		1	1	1	1		1	1	1	1	1					

For Action Group A2, 4 out of 19 respondents which report measuring falls show no overlap with primary indicators or common secondary indicators. Out of the remaining 15 respondents, 5 have no overlap with primary indicators.

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