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Key Performance Indicators for Australian Public Mental Health Services: Potential Contributions of MH-NOCC Data

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Section 1: Background and context

The development of key performance indicators for Australian public sector mental health services

In 2004, the National Mental Health Working Group (NMHWG) Information Strategy Committee's Performance Indicator Drafting Group published *Key Performance Indicators for Australian Public Mental Health Services.*[1] The report proposed a set of key performance indicators for use in Australia's public sector mental health services.
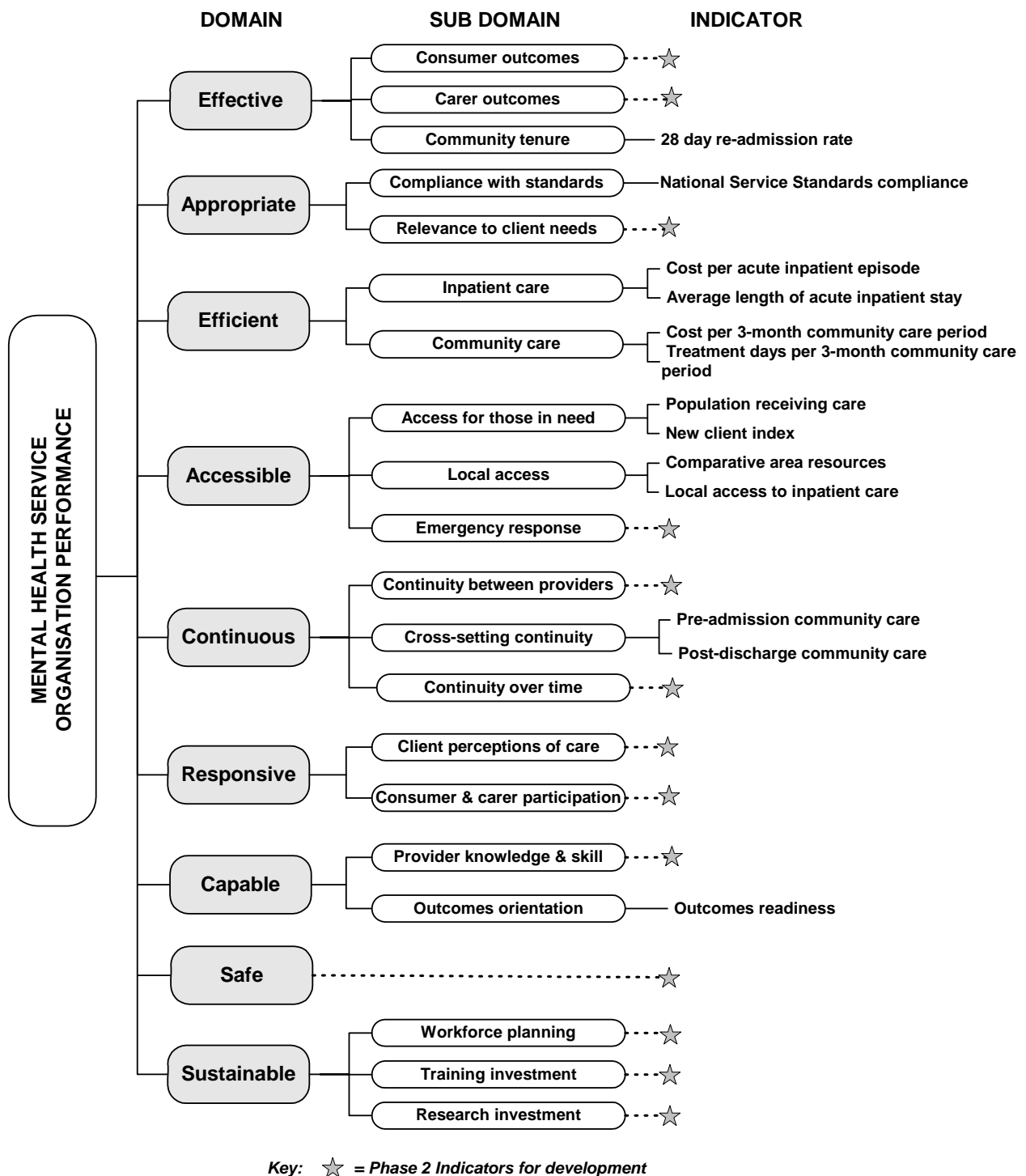
The *Key Performance Indicators* report was linked to the strategic directions of the National Mental Health Strategy, and drew on the *National Health Performance Framework* which identified three 'tiers' (health status and outcomes, determinants of health, and health system performance). The *Key Performance Indicators* report focused on the third of these tiers, and based its proposed key performance indicators for the mental health sector on nine domains advocated within this tier, namely:

- Effective – i.e., care, intervention or action achieves desired outcome

- Appropriate – i.e., care/intervention/action provided is relevant to the client's needs and based on established standards

- Efficient – i.e., achieving desired results with most cost-effective use of resources

- Responsive – i.e., service provides respect for persons and is client-oriented (respect for dignity, confidential, participate in choices, prompt, quality of amenities, access to social support networks, and choice of providers)

- Accessible – i.e., ability of people to obtain health care at the right place and right time, irrespective of income, geography and cultural background

- Safe – i.e., potential risks of an intervention or the environment are identified and avoided or minimised

- Continuous – i.e., ability to provide uninterrupted, coordinated care or service across programs, practitioners, organisations and levels over time

- Capable – i.e., an individual or service's capacity to provide a health service based on skills and knowledge

- Sustainable – i.e., system or organisation's capacity to provide infrastructure such as workforce, facilities and equipment, and be innovative and respond to emerging needs (research, monitoring).

The *Key Performance Indicators* report further specified each of these domains into sub-domains covering the most salient matters of concern, again drawing on the *National Health Performance Framework*. It then developed key performance indicators for these sub-domains, concentrating on 13 Phase 1 indicators for initial trial, on the grounds that these were suitable for immediate introduction based on available data collected by all States and Territories. It also proposed areas for Phase 2 indicator development, which covered sub-domains identified as important for

monitoring overall mental health service performance but for which lack of available data precluded immediate development of relevant indicators. The report indicated that both Phase 1 and Phase 2 indicators would require ongoing review, modification and refinement over time. Figure 1 shows the domains, sub-domains and performance indicators proposed in the *key Performance Indicators* report.

Figure 1: Summary of performance framework and proposed indicators for Australian public sector mental health services

DOMAIN	SUB DOMAIN	INDICATOR
Effective	Consumer outcomes	☆
	Carer outcomes	☆
	Community tenure	**28 day re-admission rate**
Appropriate	Compliance with standards	**National Service Standards compliance**
	Relevance to client needs	☆
Efficient	Inpatient care	**Cost per acute inpatient episode** / **Average length of acute inpatient stay**
	Community care	**Cost per 3-month community care period** / **Treatment days per 3-month community care period**
Accessible	Access for those in need	**Population receiving care** / **New client index**
	Local access	**Comparative area resources** / **Local access to inpatient care**
	Emergency response	☆
Continuous	Continuity between providers	☆
	Cross-setting continuity	**Pre-admission community care** / **Post-discharge community care**
	Continuity over time	☆
Responsive	Client perceptions of care	☆
	Consumer & carer participation	☆
Capable	Provider knowledge & skill	☆
	Outcomes orientation	**Outcomes readiness**
Safe		☆
Sustainable	Workforce planning	☆
	Training investment	☆
	Research investment	☆

Key: ☆ = Phase 2 Indicators for development

Domain tree root: **MENTAL HEALTH SERVICE ORGANISATION PERFORMANCE**

Routine outcome measurement in Australia's public sector mental health services

All States and Territories are providing the Australian Government with de-identified, consumer-level outcomes, as specified in the *National Mental Health Information Priorities* document.[2] These outcome data form the core of the Mental Health National Outcomes and Casemix Collection (MHNOCC), and are derived from 10 standardised instruments (see Table 1), and four additional measures (see Table 2). These data are collected in three different service settings at three types of 'collection occasion'. Specifically, they are administered in inpatient units, community residential services and ambulatory services, at admission, discharge and 91-day review points.[3]

As Table 1 shows, the standardised instruments represent a mix of clinician-rated, consumer-rated and consumer- and parent-rated measures, and the specific instrument(s) used at a given data collection occasion depend on the age group of the consumer (adults, older persons, children and adolescents). Although not shown in Table 1, the type of episode (inpatient, ambulatory, residential) and the reason for collection (admission – new referral, admission – admitted from other treatment setting, admission – other, review – 3-month review, review – other, discharge – no further care, discharge – change of treatment setting, discharge – death, discharge – other) also influence the specific instrument(s) used. The contextual rules governing the administration of specific instruments are described in detail elsewhere. [3]

As indicated in Table 2, the four additional measures are factors influencing health status, focus of care, mental health legal status, and principal and additional diagnoses. Again, the protocol dictating their collection is governed by consumer age group (shown in Table 2), and factors related to the type of episode and reason for collection (not shown in Table 2).

The contribution of routine outcome measurement to the development of key performance indicators

The above developments in routine outcome measurement in Australia's public sector mental health services create opportunities for developing new key performance indicators to address some of the sub-domains for which data were previously unavailable. In particular, and as noted in the *Key Performance Indicators* report, these outcome data lay the foundation for more direct indicators of service effectiveness, providing clinician and consumer perspectives on the extent to which services are effective in achieving in improvements in consumers' symptom severity and level of functioning.

In addition, there are opportunities for augmenting or refining existing key performance indicators in other domains, including those of efficiency, accessibility and safety. The proposals outlined in this paper build on earlier work commissioned by the Australian Government and undertaken by the current authors in the 1999 report *Measuring Quality in Australian Mental Health Services*,[4] based on data available from the Mental Health Classification and Service Costs Project.[5-7]

The current report

The current report proposes additional or modified key performance indicators in the domains of effectiveness, efficiency, accessibility and safety. In doing so, it makes recommendations for Phase 2 indicator development. Sections 2, 3, 4 and 5 propose phase 2 indicators in each of the four domains, respectively, providing a rationale for each and discussing relevant conceptual and technical issues.

Table 1: Standardised instruments included in the MHNOCC dataset

		Adults	Older persons	Children and adolescents
Clinician-rated	Health of the Nation Outcome Scales (HoNOS)	√		
	Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA)			√
	Health of the Nation Outcome Scales 65+ (HoNOS65+)		√	
	Life Skills Profile 16 (LSP-16)	√	√	
	Resource Utilisation Groups – Activities of Daily Living Scale (RUG-ADL)		√	
	Children's Global Assessment Scale (CGAS)			√
Consumer-rated	Mental Health Inventory (MHI) or Behaviour and Symptom Identification Scale 32 (BASIS-32®) or Kessler-10 Plus (K-10+)	√	√	
Consumer- and parent-rated	Strengths and Difficulties Questionnaire (SDQ)			√

Source: Department of Health and Ageing (2003)[3]

Table 2: Additional measures included in the MHNOCC dataset

		Adults	Older persons	Children and adolescents
Clinician-rated	Factors Influencing Health Status (FIHS)			√
	Focus of Care	√	√	
	Mental Health Legal Status	√	√	√
	Principal and Additional Diagnoses	√	√	√

Source: Department of Health and Ageing (2003)[3]

Section 2: Effectiveness

Sub-domains and Phase 1 indicators

Three sub-domains of effectiveness were proposed in the *Key Performance Indicators* report, namely:

- Consumer outcomes

- Carer outcomes

- Community tenure

The only Phase 1 indicator developed for initial trial was 28 day admission rates, designed to assess the sub-domain of community tenure.

Phase 2 indicators

A single Phase 2 indicator is proposed, namely:

- Clinically significant HoNOS (or HoNOSCA or HoNOS65+) change

This indicator addresses the sub-domain of consumer outcomes, and assesses severity of symptoms from the clinician's perspective. It is proposed that once the indicator is developed and adopted, improvement on other measures that assess other dimensions from both clinician and consumer perspectives be considered. It should be noted that at this stage it is not possible to consider the sub-domain of carer outcomes because there are no carer-specific measures in the MH-NOCC suite.

The HoNOS family have been recommended as the 'pilot' outcome measures for several reasons. Compliance with these measures is comparatively high. They are administered for consumers of the relevant age group at all collection occasions and in all service settings, providing more opportunities for examining change (i.e., outcome) than some other measures in the MH-NOCC suite. In addition, they have been subject to relatively greater psychometric testing than some other measures in the MH-NOCC suite, and have shown to be valid, reliable and sensitive to change.[8, 9]

It is important to first consider that pattern of mental health care within each of the three collection occasion age groups and within each of the three mental health service settings. Table 3 shows the major patterns arising by age group and setting, as reported to MH-NOCC to date.

Table 3: Proportion of episodes of mental health care types by collection occasion, age group and service setting

Setting	Episode type	Child and Adolescent	Adult	Older persons
Psychiatric inpatient	Complete (Admission > Discharge)	85%	80%	60%
Community residential	Ongoing (Review > Review)	NA	70%	70%
	Complete (Admission > Discharge)	NA	20%	15%
Ambulatory	Complete (Admission > Discharge)	40%	25%	40%
	Ongoing (Review > Review)	20%	50%	40%

Source: Australian Mental Health Outcomes and Classification Network (2005)[10]

It can be seen that the majority of Psychiatric Inpatient episodes are 'complete'. By contrast, in Community Residential settings, the ratio of 'completed' to 'ongoing' episodes is approximately equal (note for Children and Adolescents there are too few episodes arising in this setting to justify reporting by KPIs). The greater proportion of Ambulatory episodes is 'complete' for Children and Adolescents; in contrast, for Adults, the greater proportion of these episodes is 'ongoing'. For Older Persons, there are equal proportions of 'complete' and 'ongoing' episode types in Ambulatory settings.

It is proposed that, consistent with the other indicators presented in the *Key Performance Indicators* report, clinically significant change on the HoNOS and related measures would be assessed from admission to discharge in acute inpatient episodes and similarly in ambulatory settings. For ongoing episodes, in many instances the goal of treatment is to ensure the stability of symptoms, minimisation of disability and the promotion of recovery. Indicators of 'effectiveness' in these circumstances might be gauged from the Focus of Care and be measured over 91 day periods in community residential and ambulatory episodes. This is further discussed below.

It is also proposed that, at least in the first instance, change would be assessed using the HoNOS, HoNOSCA or HoNOS65+ total score, in its raw form. There is potential for exploring change on individual item scores (e.g., for particular diagnostic groups). There is also potential for converting raw change scores to effect sizes, in order to make comparisons across different outcome measures. For now, however, there is an argument that it is better to err on the side of simplicity.

Various factors must be taken into consideration in operationalising this indicator. Firstly, there is the issue of how to categorise change. One possibility is to classify consumers in given episodes within particular settings as having 'improved', demonstrated 'no change' or 'deteriorated'. The proportion of consumers in each group could be quantified, and particular cut-offs could be set as targets.

This is complicated by a second issue, that of the expectation of change. This relates to various factors, one of which is setting. While it would be hoped that people in acute inpatient settings would improve during the course of an episode of care, this might not be a realistic expectation in all settings. In ambulatory settings, the desirable outcome for some people would be improvement, but the desirable outcome for others might be prevention of relapse (i.e., no change). In community residential settings, the expectation might be maintenance (i.e., no change) rather than improvement. The corollary of this might be that the cut-offs for targets might differ between settings.

Thirdly, and related to the issue of expectation of change, is the question of how much potential there is for change. Someone who is relatively well at admission to any setting obviously has less scope for improvement than someone who is experiencing more severe symptoms. In the current context, this means that there may be a need to adjust HoNOS change scores for the initial HoNOS score, in order to 'level the playing field'.

Fourthly, there is the question of how much improvement (or, for that matter, deterioration) constitutes 'clinically significant change'. Authors such as Kendall and Grove[11] have advanced quite strict definitions of 'clinically significant change', which amount to individuals or groups moving from being members of an 'ill' population to members of a 'well' population. There are problems with applying these definitions in the current context, partly because of the issue of expectation of change (described above), but also because of the lack of normative data on 'well' populations. Trauer, Duckmanton and Chiu[12] addressed the issue (using the LSP rather than the HoNOS), by considering hospitalised individuals and comparing them with those in the community (as opposed to 'ill' and 'well' individuals). An alternative approach might be to determine the typical HoNOS change score associated with discharge from an inpatient setting to a community setting, or discharge from a community setting to no further care. Yet another approach might be to consider the proportion of HoNOS items on which there has been positive change of at least two points.

In relation to the latter idea, Parabiaghi et al[13] developed a classification of severity as measured by the HoNOS for consumers seen in community mental health services, based on the work of Lelliot.[14] Operationally, a score of ≥3 in at least one of the 12 HoNOS items was proposed to discriminate between severe and non-severe patients. They further distinguished severity the group of very severe subjects with a score of ≥3 in at least two items. The group of subclinical subjects had a score <2 in all items. The criterion discriminating: (i) between 'very severe' and 'moderately severe' patients is having more than one item's score of ≥3; and (ii) between 'mild' and 'subclinical' patients is having at least one item's score of 2.

There is the question of what constitutes 'reliable' change. This differs from 'clinically significant change'. Reliable change refers to the extent to which an observed change falls beyond the range attributable to the measurement error. It concerns the consistency of the measurement (i.e., the extent to which scores are the same from one administration of the HoNOS, HoNOSCA or HoNOS65+ to the next, in the absence of any clinical change). As noted above, the HoNOS family of measures have been shown to be relatively reliable, but some variability in scores from one administration to the next would still be expected. This highlights the need to assess the reliability of any change scores (e.g., by calculating confidence intervals around them), and setting limits as to the degree of unreliability that would be acceptable.

As a final issue, consideration needs to be given to the degree of confidence to be attributed to observed variation in the indicators. In social sciences, there is a tradition of setting statistical confidence limits at the 95th percentile. In that sense, there is a 95% chance that any specific confidence interval actually contains the population mean. It could be argued that this standard is too strict for the routine monitoring of clinical outcome performance. Alternative intervals, such as the 90th and 80th percentiles might more reasonably reflect stakeholder expectations regarding the integrity of information as decision making tools.

Section 3: Efficiency

Sub-domains and Phase 1 indicators

Two sub-domains of efficiency were proposed in the *Key Performance Indicators* report, namely:

- Inpatient care

- Community (ambulatory) care

These were considered separately, because there was felt to be a need to ensure comparisons were based on similar services or care types.

Four Phase 1 indicator developed for initial trial, the first two for the sub-domain of inpatient care and the second two for the sub-domain of community care. These were:

- Cost per acute inpatient episode

- Average length of acute inpatient stay

- Cost per three month community (ambulatory) care period

- Treatment days per three month (ambulatory) community care period

Phase 2 indicators

As noted in Section 1, the definition of efficiency used in the *National Health Performance Framework* document and adopted in the *Key Performance Indicators* report is 'achieving desired results with the most cost effective use of resources'. In order to examine efficiency, therefore, it is necessary to consider outcomes as well as costs or resource inputs. It could be argued that the above indicators do the latter but not the former. Using routinely-collected outcome data from the MH-NOCC dataset, it would be possible to augment these indicators so that they more accurately assess efficiency.

Specifically, it is recommended that the indicators be modified to consider cost (or length of stay) per unit of outcome in the given setting (i.e., cost-outcome descriptions). In other words, they would become:

- Average cost per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change in acute inpatient episodes

- Average length of acute inpatient stay per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change on the in acute inpatient episodes

- Average cost per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change in three month community (ambulatory) care periods

- Average treatment days per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change in three month community (ambulatory) care periods

The issues associated with assessing cost and length of stay were discussed in the *Key Performance Indicators* report, and relate to standardising episodes and periods of care to ensure comparisons of like-with-like.

The issues associated with assessing clinically significant change are discussed in the previous section, as they relate to measuring effectiveness.

Section 4: Accessibility

Sub-domains and Phase 1 indicators

Two sub-domains of accessibility were proposed in the *Key Performance Indicators* report, namely:

- Access for those in need

- Local access

- Emergency response

Four Phase 1 indicators were developed for initial trial, the first two for the sub-domain of access for those in need, and the second two for the sub-domain of local access. These were:

- Population treatment rates

- New client index

- Local access to inpatient care

- Comparative area resources

Phase 2 indicators

Several of the Phase 1 indicators address the issue of the extent to which services are meeting need. This is appropriate given the definition of accessibility used in the *Key Performance Indicators* report, namely 'the ability of people to obtain health care at the right place and right time, irrespective of income, physical location and cultural background'. The population treatment rates indicator, for example, is a proxy measure of treated prevalence. This is tied in with the concepts of 'met need' and 'unmet need' – i.e., whether the appropriate proportion of those in a given population with need for mental health care are in fact receiving such care, or whether there is a residual group whose needs remain unaddressed.

Various authors have argued that 'met need' and 'unmet need' should be considered in tandem with the concept of 'met unneed' – i.e., the situation where services are being provided to those with no need for mental health care.[15] This concept can help 'round out' the picture regarding treated prevalence, by clarifying whether the numerator is higher than it should be. The MH-NOCC dataset presents an opportunity to consider 'met unneed', and it is proposed that the following indicator be modified by considering presentations with clinically significant HoNOS (or HoNOSCA or HoNOS65+) items:

- Population treatment rates

It is proposed that the proportion of admissions to inpatient and ambulatory episodes with at least one clinically significant HoNOS (or HoNOSCA or HoNOS65+) item – i.e., at least one item with a score of 2 or higher – be considered. The inverse of this – i.e., the proportion with no clinically

significant items – provides a proxy for 'met unneed', in the sense that it quantifies the proportion of episodes provided to people with no demonstrable clinical problems.

In assessing 'met unneed' in this way, various technical considerations would need to be taken into account. For example, in order for data from this indicator to be combined with data from the population treatment rates indicator to more accurately assess treated prevalence, the admission-based or episode-based count would need to be converted to a person count.

Section 5: Safety

Sub-domains and Phase 1 indicators

No sub-domains or Phase 1 indicators for the safety domain were proposed in the *Key Performance Indicators* report, but consideration was given to the areas they might encompass. In particular, reference was made to the main priority themes emerging from the *Mental Health Safety Action Plan*, such as:

- Reducing suicide and deliberate self-harm in mental health and related settings

- Reducing adverse events associated with restraint and seclusion and ensuring their appropriate use

- Reducing adverse medication events in mental health services

- Safe transport of people experiencing mental illness

Phase 2 indicators

The MH-NOCC dataset has the potential to assist with refining the first of the above priority themes into more explicit indicators. Specifically, by making use of HoNOS Item 2, it would be possible to develop an indicator of the proportion of episodes in which a suicide attempt was made under care. A score of 4 on HoNOS Item 2 indicates that, during the previous two weeks, the person made a serious suicidal attempt and/or suffered serious deliberate self injury. A score of 4 on this item at any point during a given episode (with the exception of the rating at admission which covers the two weeks prior to the episode) could therefore be taken as evidence that the person had made a suicide attempt. In this way, it would be possible to determine the proportion of episodes that involved a suicide attempt, and seek reductions in this proportion over time. The specific indicator might be:

- Episodes during which a suicide attempt occurs

In addition to suicide attempts, other critical incidents might also be considered under the aegis of safety. For example, one factor that might contribute to the safety of both consumers and providers is aggressive acts. HoNOS Item 1 relates to aggressive behaviour, and a score of 4 on this item indicates that, during the previous two weeks, the person made at least one serious physical attack on others, engaged in major or persistent destructive activity (e.g., fire–setting), engaged in persistent and threatening behaviour, was severely over-active or agitated, was sexually disinhibited or engaged in other inappropriate behaviour, was consistently restless or wandering or displayed severe non-compliant or resistive behaviour. Arguably, a score of 4 on Item 2 at any point during a given episode (with the exception of the rating made at admission which covers the two weeks prior to the episode) could be taken as evidence that the person had engaged in aggressive behaviour, or threatened the safety of others in other ways. Using this item, it would be possible to determine the proportion of episodes that involved aggressive or other safety-compromising behaviour, and seek reductions in this proportion over time. The specific indicator might be:

- Episodes during which the safety of others is compromised by aggressive (or other threatening) behaviours

# Section 6: Next steps in developing Phase 2 indicators

To summarise, eight Phase 2 indicators are proposed here to inform the domains of effectiveness, efficiency, accessibility and safety:

- Clinically significant HoNOS (or HoNOSCA or HoNOS65+) change

- Average cost per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change in acute inpatient episodes

- Average length of acute inpatient stay per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change on the in acute inpatient episodes

- Average cost per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change in three month community (ambulatory) care periods

- Average treatment days per clinically significant HoNOS (or HoNOSCA or HoNOS65+) change in three month community (ambulatory) care periods

- Population treatment rates (modified to include consideration of presentations with clinically significant HoNOS (or HoNOSCA or HoNOS65+) items

- Episodes during which a suicide attempt occurs

- Episodes during which the safety of others is compromised by aggressive (or other threatening) behaviours

Figure 2 shows how these new or modified indicators complement the suite proposed in Phase 1.

These indicators have been put forward for discussion, and are not in any way definitive. Assuming that there is stakeholder support for these or similar indicators, the next step in their development will involve the resolution of the relevant conceptual and technical issues flagged in the earlier Sections of this report. Resolving these issues will require recourse to existing MH-NOCC data, as well as ongoing consultation with relevant stakeholders. Once these issues have been resolved, detailed technical specifications can be developed, and the specific indicators can be trialed.

Figure 2: Summary of modified performance framework, including proposed Phase 2 indicators
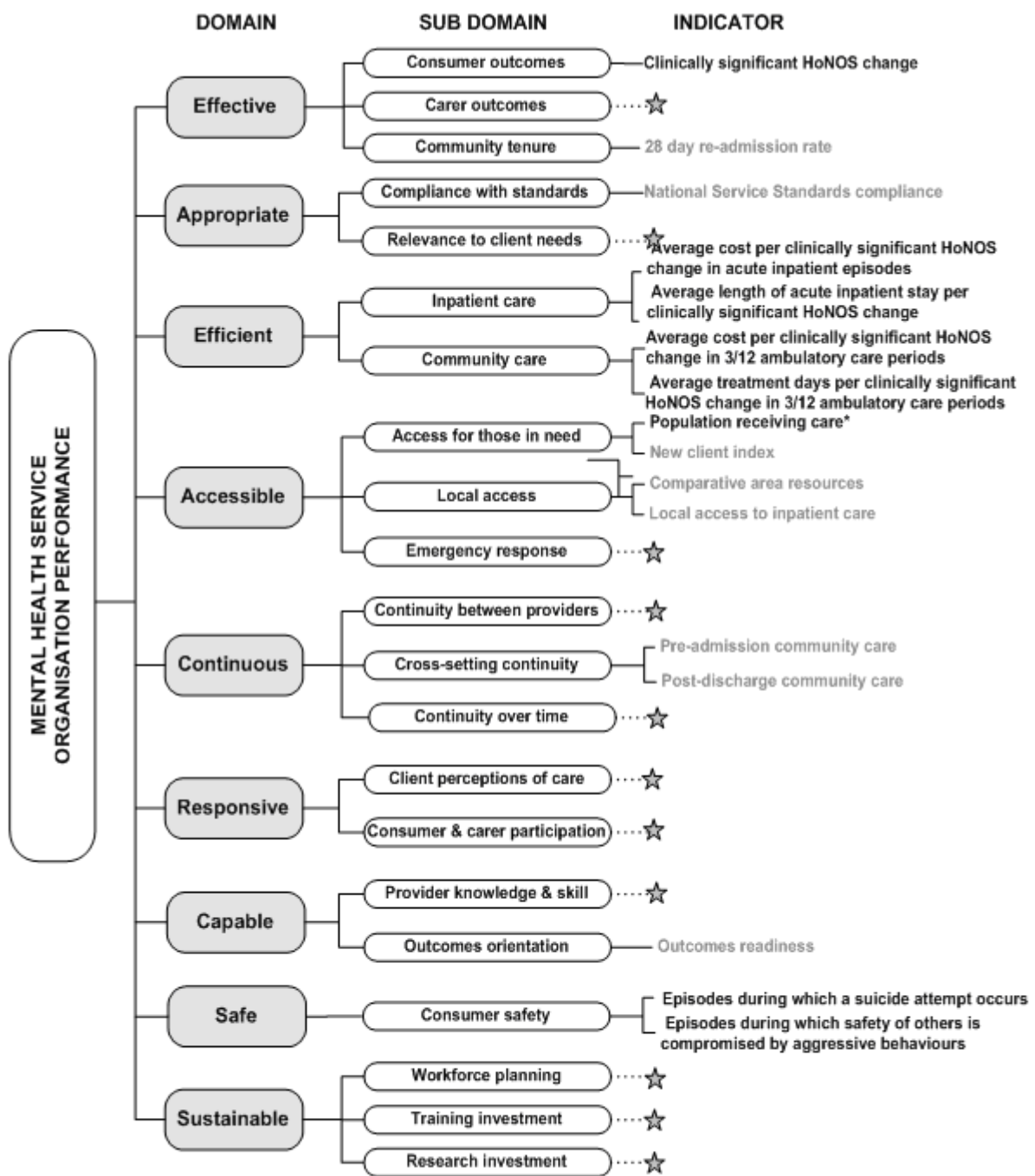
*Modified to include consideration of presentations with clinically significant HoNOS items

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