Modelling bed numbers for NSW using the Drug and Alcohol Service Planning Model (DASPM)

Richard Mellor and Alison Ritter

Drug Policy Modelling Program, SPRC

University of New South Wales

13th February 2019

Table of Contents

List of Tables

1. Executive Summary

This project was commissioned by the Network of Alcohol and other Drugs Agencies (NADA).

The aim of this work was to produce an independent, evidence-driven estimate of the number of alcohol and other drug treatment beds (withdrawal beds and residential rehabilitation beds) required per annum to meet demand for alcohol and other drug treatment in NSW.

DASPM produces an estimate of bed numbers required per annum, classified into:

- Residential rehabilitation beds
- Detoxification beds
- Inpatient beds

The researchers endeavoured to maintain the integrity of the DASPM according to its original specifications, including the population estimates (latest figures for NSW (and LHDs) from the ABS were used); the epidemiology for substance use disorders (the original national figures established for DASPM were used); the distribution of substance use disorders into three levels of severity (mild, moderate, severe)=the treatment rate; and the distribution across care packages. These last three were modified from the original DASPM for greater validity and applicability in NSW. A workshop was held with clinical experts (NGO residential service providers; 18th January 2019) to provide advice to the researchers on the treatment rates and the assignment to care packages.

Three versions of DASPM were run. The first was the original DASPM care package allocations applied to the updated NSW population and with updated severity distribution (for amphetamine) and treatment rates (for amphetamine and opioids) ("Original DASPM"). The second ("Model 1") used the updated NSW population and updated severity distributions/treatment rates, with the care package allocations to residential rehabilitation reflecting the current NSW episode of care data. The third run ("Model 2") applied a 1.5 multiplier to the residential rehabilitation care package allocations from the original DASPM (with the updated NSW population and the updated severity distributions/treatment rates).

The bed estimates ranged from 2,078 beds (Model 1) to 3,402 beds (Model 2) inclusive of inpatient, withdrawal and residential rehabilitation beds in NSW.

DASPM is agnostic to who the provider is of these 2,000 to 3,400 beds – they may be provided by government services, by non-government services and/or by private providers. DASPM predicts the numbers of beds required to meet population demand. Any comparison of the bed numbers here with the current numbers of beds in NSW must therefore include all types of beds across all settings (government, non-government, private).

The vast majority of the beds predicted were for residential rehabilitation: For Model 1, of the total 2,078 beds, 1,718 beds were for residential rehabilitation (83%) with 290 for withdrawal and 70 for inpatient withdrawal.

The vast majority of the beds were for the treatment of alcohol dependence: For Model 1 1063 beds for the treatment of alcohol dependence (51%) with the remainder for amphetamine, opioids, cannabis and benzodiazepines.

Bed estimates were also broken down for each LHD in NSW (see details herein).

The original and unchanged version of DASPM (for example with a 35% treatment rate for severe amphetamine dependence) produced a bed estimate for NSW of about 2,000 residential rehabilitation beds. The figures provided here for Model 1, with new runs of DASPM based on current resi rehab EOC allocations in NSW do not dramatically vary from that estimate (Model 2 almost doubles the estimate and is at the high end of the prediction).

There are a number of reasons why these modelled estimates may be considered too high. The most obvious reason is that the model predicts too many people to receive treatment overall.

- The overall treatment rate modelled for NSW (that is, of all people who meet diagnostic criteria for substance use disorder) is in the order of about half of those with a diagnosed substance use disorder. It varies by drug type: 35% for alcohol; 65% for amphetamine; 35% for cannabis; 45% for benzodiazepines; and 100% for opioids. These treatment rates might be perceived to be too high, although good planning does account for treatment for those with a disorder (recalling that DASPM only models people who meet diagnostic criteria).

Given the modest overall treatment rates, especially for alcohol use disorders which are the most common, the second reason why these estimates may be too high is because too many people receive residential rehabilitation care (instead of for example outpatient psycho-social counselling). The parameters here in the model are:

- Of all people receiving treatment for a severe substance use disorder in NSW, approximately 8% of them receive a residential rehabilitation service (the figures vary by drug type and by Model, see Table 8)
- Each person assigned to a residential rehabilitation care package, also receives a seven-day withdrawal prior to residential rehabilitation entry.

If it is not the numbers of people being treated, nor the amount of care allocated to residential rehabilitation instead of other types of care, the high bed numbers may be a result of the lengths of stay in the model.

- Withdrawal services (all drugs) entailed an average length of stay of seven days;
- Length of stay in residential rehabilitation (for people aged 18-64 in demand of alcohol treatment – for example) is on average 8 weeks (for 31% of the people allocated to residential rehabilitation); 13 weeks (for 38% of the people allocated to residential rehabilitation); and 26 weeks (for 31% of the people allocated to residential rehabilitation).

If the above assumptions (concerning how many people should be treated; how many should receive residential rehabilitation as the treatment type; and the average lengths of stay in residential treatment) are varied, then the predicted bed estimates will also vary: intuitively if we reduce the number of people being treated, reduce the allocations to residential rehabilitation, and reduce the lengths of stay, the numbers of predicted beds will be lower.

2. Aim

This project was commissioned by the Network of Alcohol and other Drugs Agencies (NADA).

The aim of this work was to produce an independent, evidence-driven estimate of the number of alcohol and other drug treatment beds (withdrawal beds and residential rehabilitation beds) required per annum to meet demand for alcohol and other drug treatment in NSW.

3. Overview of DASPM for NSW

The Drug and Alcohol Services Planning Model (DASPM) is a national planning model that was developed between 2010 and 2013. The national DASPM includes five different drug types (alcohol, benzodiazepine, cannabis, amphetamine, opioids). It covers young people (12 to 17 years of age), adults (18 to 64 years of age) and elderly people (65 years of age and older). The model operates on the assumption of averages (that is it does not predict resources for any one individual but for an average of individuals, spread across a range of problem severities and a range of different types of treatment). For more details on the DASPM please see Attachment 1.

The DASPM produces various outputs, in this instance **the numbers of beds** required to meet demand in NSW for inpatient and residential withdrawal and residential rehabilitation. There are many other aspects to DASPM, including other types of specialist AOD care, notably psycho-social counselling, outpatient withdrawal, day programs, brief interventions, and OTP. These were not within scope for this project as the focus was solely on 'beds'.

DASPM produces an estimate of bed numbers required per annum, classified into:

- Residential rehabilitation beds
- Detoxification beds
- Inpatient beds

The researchers endeavoured to maintain the integrity of the DASPM according to its original specifications, including the population estimates (latest figures for NSW (and LHDs) from the ABS were used); the epidemiology for substance use disorders (the original national figures established for DASPM were used); the distribution of substance use disorders into three levels of severity (mild, moderate, severe: the original national figures established for DASPM were used); the treatment rate; and the distribution across care packages. These last two were modified from the original DASPM for greater validity and applicability in NSW. A workshop was held with clinical experts (NGO residential service providers; 18th January 2019) to provide advice to the researchers on the treatment rates and the assignment to care packages.

Each of the parameters is discussed in turn.

3.1. Population

The population used in the model is the population of NSW (over 12 years of age). People younger than 12 years of age were not included in the model, because DASPM does not provide bed numbers for people under 12 years of age. The 2017 ABS data on the Estimated Resident Population for NSW was used (see Table 1).

Table 1. Estimated resident population for NSW, 30 June 2017 (ABS)

Age range	Population
12 to 17 years	546,277
18 to 64 years	4,871,052
65+ years	1,249,740
12+ years	6,667,069

Source: http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3101.0Jun%202018?OpenDocument

The population boundary for the DASPM analyses was the state of NSW. This means that people who enter treatment in NSW from other jurisdictions (such as Victoria and/or the ACT) are not accommodated in the model. Likewise, people who are residents in NSW but who receive treatment in other jurisdictions are also not managed within the modelling process. Expert advice suggests that this constraint would not have a major impact on the modelled results.

The bed numbers were also estimated for each LHD in NSW. The model requires a minimum population of 100,000 to be valid – therefore LHD bed numbers cannot be provided per age-group (as the numbers within each age group were smaller than 100,000). Instead bed estimates within each LHDs were provided for the entire population over 12 years of age. The populations of each LHD (as of 30 June 2016) that were used in the modelling are provided in Table 2. Far West and Albury Wodonga LHD have a population (12+ years of age) less than 100,000 people in total. Therefore, to ensure validity of the model, these two LHDs were combined with Southern NSW LHD to estimate bed numbers.

Table 2. NSW LHD population, ages 12 and over, 30 June 2016

	12-17	18-64	65+	12+
Sydney	30,993	465,443	72,885	569,321
South Western Sydney	79,406	595,064	122,507	796,977
South Eastern Sydney	50,906	613,753	130,927	795,586
Illawarra Shoalhaven	29,024	238,963	78,076	346,063
Western Sydney	68,739	607,405	105,815	781,959
Nepean Blue Mountains	28,568	227,066	51,201	306,835
Northern Sydney	64,592	568,938	142,959	776,489
Central Coast	24,708	192,186	67,484	284,378
Hunter New England	66,698	533,574	171,018	771,290
Northern NSW	21,507	167,765	65,801	255,073
Mid North Coast	15,886	118,384	51,348	185,618
Murrumbidgee	18,761	137,084	46,462	202,307
Western NSW	21,568	160,107	50,317	231,992
Southern NSW	14,786	120,604	40,285	175,675
Far West	2,032	17,477	5,884	25,393
Albury Wodonga Health (NSW portion)	3,811	31,286	8,997	44,093
Total	541,984	4,795,098	1,211,967	6,549,049

Data source: Supplied by HealthStats, NSW Ministry of Health, 23/1/19. There are no estimates available beyond 2016.

3.2. Alcohol and Drug Epidemiology

DASPM relies on the notion of a 'diagnosis' in the model, in order to derive the starting figure for the number of people in potential need of treatment. The prevalence rates of substance use disorder (for the five drug classes) applied to NSW were taken from the original national model, as detailed in Table 3.

Table 3. Prevalence rates (with sources) applied to NSW as used in the original DASPM

	12-17 years	18-64 years	65+ years	Data source
Alcohol	1.06%	6.35%	1.42%	AUSBoD data from NSMHWB (Begg et al., 2007)
Amphetamine	0.13%	0.51%	0.01%	As reported in AUSBoD (Begg et al., 2007) & used in NMDS-AODT and a McKetin,

				McLaren, Kelly, Hall, and Hickman (2005) multiplier
Benzodiazepine	0.13%	0.51%	0.01%	AUSBoD data from NSMHWB
Cannabis	0.48%	1.76%	0.05%	AUSBoD data from NSMHWB
Opioid	0.03%	0.65%	0.11%	Chalmers, Ritter, Heffernan, and McDonnell (2009) multiplier

3.3. Distribution of Severity

The population meeting substance use disorder criteria (as above) needs to be split into three levels of disability: mild, moderate and severe. The reason for dividing the diagnosed population into these three groups is to increase the validity of the model outputs – not everyone experiences the same level of severity of problem, and the type of treatment best suited to someone will depend on their level of severity. If some have relatively mild substance use problems, they will not require a six-month residential rehabilitation intervention, nor withdrawal, but will be responsive to an outpatient psycho-social intervention. Hence the divisions into mild, moderate and severe then determine the allocations to the types of treatment (care packages) in DASPM. They are also important in determining the treatment rate: not everyone with mild substance use problems will necessarily require treatment, but for those with severe problems, it is highly likely they will require treatment.

The terms 'mild', 'moderate' and 'severe' come from the original national DASPM, which relied on both diagnostic rates plus a mental health notion of functional impairment to distribute the population into those three categories (using the disability weights from the SF12). It is sensible to think about these terms in relation to physical, psychological and social problems associated with substance use, that is functional impairment (rather than thinking about these terms as a reflection of amount consumed).

The severity distribution from the original DASPM is given in Table 4. For example, for alcohol, 67% of people with an alcohol diagnosis are considered to have a mild disorder, 22% are considered to have a moderate disorder, and 11% a severe disorder.

Table 4. Severity distribution (mild, moderate, severe) for each of the five drugs

		Severity Distribution
Alcohol (6:2:1)	Mild	67%
	Moderate	22%
	Severe	11%
Amphetamine (0:1:9)		
	Mild	0%
	Moderate	10%
	Severe	90%
Benzodiazepine (5:3:2)	Mild	50%
	Moderate	30%
	Severe	20%
Cannabis (6:2:1)	Mild	67%

	Moderate	22%
	Severe	11%
Opioids (0:0:1)	Mild	0%
	Moderate	0%
	Severe	100%

We preferred not to alter the severity distributions from the original, however for amphetamines, the original model parameters were not valid. 90% with a severe amphetamine dependence, and 0% with a mild amphetamine dependence is not realistic. Therefore we adjusted the severity distribution for amphetamines to be: 30% in the mild severity; 40% in the moderate severity; and 30% in severe.

For opioids, the original DASPM was concerned only with heroin (not with pharmaceutical opioids). As such the severity distribution (and treatment rate) reflected heroin dependence (hence the 100% in the severe category). We chose not to change this from the original, as it would involve major redevelopment of DASPM to accommodate pharmaceutical opioids. The opioid results should therefore be treated with caution.

3.4. Treatment Rate

The treatment rate represents the proportion of people within each category that requires treatment. The national treatment rate figures established for DASPM are outlined in Table 5. For example, for alcohol, cannabis, and benzodiazepine, 20% of people with mild disorders were estimated to require treatment, 50% of people with moderate disorders, and 100% of people with severe disorders were estimated to require treatment.

The treatment rates and their application to NSW for this project were reviewed by the expert group convened by NADA. These were providers of NGO treatment in NSW notably withdrawal services and residential rehabilitation services. The focus was solely on the treatment rates for the 'severe' group, as it is only this category that generates care packages with beds for residential rehabilitation and withdrawal services.

The original 'severe' national treatment rates for alcohol, benzodiazepine, and cannabis were 100%. The expert group agreed that these are appropriate rates to apply for NSW in 2018. The expert group noted, however, that the original 'severe' treatment rates in the DASPM model (2010-2013) for opioids (90%) and amphetamine (35%) were potentially outdated. The expert group members noted that there are now increasing pressures from non-voluntary referral sources, including the expansion of court and diversion programs, and the introduction of drug testing in the workplace – both of these factors result in increased demand on treatment, and were less prominent in 2010-2013 when the DASPM was originally developed. Further, at the time DASPM was developed the issue of crystal methamphetamine had not yet surfaced in NSW. The original DASPM was therefore configured for 'amphetamine type stimulants', inclusive of drugs such as powder amphetamine and ecstasy. The expert group noted that the treatment rate for the original ATS was 35% for severe, which does not accord with their experience, nor with the data on the harms associated with crystal methamphetamine. For these reasons the severe treatment rate for amphetamines was changed from 35% to 100%, and for opioids from 90% to 100%. This also aligns the severe treatment rate with the other drug types in DASPM.

No other changes to treatment rate were made.

Table 5. Treatment Rates (mild, moderate, severe) for all drugs

		Treatment Rate original DASPM	Treatment rate applied for this current NSW analysis
Alcohol			
	Mild	20%	20%
	Moderate	50%	50%
	Severe	100%	100%
Amphetamine			
	Mild	0%	50%
	Moderate	50%	50%
	Severe	35%	100%
Benzodiazepine			
	Mild	20%	20%
	Moderate	50%	50%
	Severe	100%	100%
Cannabis			
	Mild	20%	20%
	Moderate	50%	50%
	Severe	100%	100%
Opioids			
	Mild	0%	0%
	Moderate	0%	0%
	Severe	90%	100%

Note: as this project only examined beds, and beds only appear in the severe care packages, the treatment rates for mild and moderate are not relevant to the output derived herein.

3.5. Care Packages

Care packages describe treatment over the course of one year. In the DASPM original national model, there are more than 90 different care packages (across the five drug types and three age groups). The care packages of relevance here are those that contain residential/inpatient beds. These comprise the residential withdrawal care packages and the residential rehabilitation care packages.

Residential withdrawal – beddays (length of stay)

The residential withdrawal care packages (care over the course of year) for adults include comprehensive assessment, a residential/inpatient detoxification, medications for withdrawal and then subsequent psychosocial counselling and support, ongoing case management, tobacco control interventions and assertive follow-up. For our purposes in this work, we are only concerned with the beddays. In summary, Table 6 gives the residential withdrawal length of stay within the care packages (adults).

Table 6. Residential withdrawal length of stay within the care packages (adult)

Drug type	**Beddays**
Alcohol	7 days
Amphetamine	7 days
Benzodiazepines	7 days (inpatient bed, for stabilisation prior to taper)
Cannabis	7 days
Opioids	7 days

Notes: the 7 days for residential withdrawal applied to both the 'standard' and the 'complex' care packages. The above table is for the adult (18-64 years) care package. The alcohol, amphetamine, benzodiazepines, cannabis (5.5 days), and opioid care packages also have an inpatient hospital withdrawal option that is also 7 days.

The residential withdrawal care packages were not altered from the original DASPM model. The expert group did note however that a 7-day detoxification for amphetamine was likely too short.

Residential rehabilitation – beddays (length of stay)
There are three different residential rehabilitation care packages for adults. In the main each of the residential rehabilitation care packages includes, over the course of one year, a cluster of services which commences with a Withdrawal Management, leading to a pre-admission phase of two weeks followed by residential rehabilitation, pharmacotherapies (for some), aftercare and outclient program and assertive follow-up provided by the residential rehabilitation services.

There are three variants:

- 8 weeks: The total beddays for this care package is 7 days withdrawal and 56 days residential rehabilitation
- 13 weeks: The total beddays for this care package is 7 days withdrawal and 91 days residential rehabilitation
- 26 weeks: The total beddays for this care package is 7 days withdrawal and 182 days residential rehabilitation

For the purposes of this NSW project, the lengths of stay for the three residential rehabilitation care packages were not altered. The expert group did note that some residential rehabilitation clients stay for 52 weeks (365 days), but were aware that DASPM works on averages – acknowledging that some clients require more than an 8; 13; or 26 week stay, while other clients may not remain for the entire time.

Allocations to residential rehabilitation care packages
Having confirmed the contents of the care packages and retaining the original lengths of stay for residential rehabilitation (and withdrawal), the only remaining question is how many people should be assigned to the residential rehabilitation care packages.

The assignment to care packages drives the estimates of the number of beddays (and hence beds). There is no objective way to assign care packages, and it relies on expert judgement. The original assignment (shown for alcohol, adults, Table 7. See Attachment 2 for all the care package assignments for each drug, and by age group), reveals that a minority of those with severe dependence and receiving treatment are assigned to receive residential rehabilitation (8% across the 3 CPs), consistent with the intensity of these care packages.

Table 7: Assignment to care packages, alcohol, adults

Care Package	% assigned to each care package
Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	12.0%
Psychosocial Interventions - With Relapse Prevention Pharmacotherapies – Standard	12.0%
Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	5.5%
Psychosocial Interventions – With Relapse Prevention Pharmacotherapies – Complex	5.5%
Withdrawal Management - Home Based - Without Relapse Prevention Pharmacotherapies – Standard	4.8%
Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	14.0%
Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	4.8%

Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Complex	10.0%
Withdrawal management - residential – with relapse prevention pharmacotherapies – complex	5.1%
Withdrawal Management - Residential – With Relapse Prevention Pharmacotherapies – Standard	11.7%
Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	5.6%
Rehabilitation – Day Program – 25 Days – Standard	1.0%
Residential Rehabilitation 8 Week Stay	2.5%
Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	3.0%
Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	2.5%
	100%

The key question asked of the expert group was whether the proportional allocations to residential rehabilitation appeared appropriate for the current period (recalling that the original DASPM allocations to care packages pertained to 2010-2013) and for NSW.

The residential rehabilitation allocations summed across the three relevant care packages in the original DASPM by drug type were:

- Alcohol: 8% (see Table 7, above)
- Amphetamine: 9%
- Opioids: 3%
- Cannabis: 9%

Experts were asked whether these needed adjustment.

The first approach to adjusting the residential rehabilitation care package allocation was based on the current pattern of treatment seeking. This sought to ask “Does the allocation of 8% (in the case of alcohol) of all care to residential rehabilitation reflect the current pattern of treatment seeking and access by NSW clients?” We used the current proportion of all episodes of care that are residential rehabilitation in NSW as taken form the AODTS-NMDS. While an episode of care is not comparable to a care package, the current distribution of care to residential rehabilitation is a useful benchmark. For alcohol this is 6% of EOC; for amphetamines it is 14%; and for cannabis it is 5%. It could not be calculated for opioids because the client data for the OTP is census data (collected in NOPSAD) and not comparable to the EOC data in the AODTS-NMDS. In the results given below, we use these percentages to allocate the residential rehabilitation care packages (“Model 1”).

A second approach to determining the allocations to the residential rehabilitation care packages is to examine whether there is currently in NSW discrepancies between supply and demand for residential services. And from any current unmet demand, use that as a multiplier onto the original DASPM allocations. We therefore asked the experts to give us an estimate of the numbers of people waiting to get into resi rehab as a proportion of the number of their beds available. Nine members provided waiting list figures for their own residential services, which translated to approximately 492 people waiting for 167 residential rehabilitation beds (see Attachment 3).

An important observation by the experts was that the same person is on more than one waiting list. So the total of approximately 492 people waiting for a resi rehab bed in NSW currently is an over-estimate. We estimated that half of people on one waiting list were also listed on another waiting list. This results in

approximately 246 people (ie 50%) waiting for 167 beds. (Note that these figures are sample data points to match bed availability, not representations of bed capacity in NSW).

To make use of these data on numbers of people waiting for beds in the allocations to the care packages, we calculated how many extra beds would be needed to treat the 246 people on the waiting list. Assuming that each person requires 90 days of resi rehab with an occupancy rate of 75%, the supply of resi rehab beds needed to multiplied by 1.5 (see Appendix 4 for steps in calculating the multiplier). This multiplier (1.5) could then be applied to the original DASPM residential rehabilitation care package allocations to better reflect current NSW conditions. In summary, three versions of DASPM were run. The first was the original DASPM care package allocations applied to the updated NSW population, and with the 100% treatment rate for severe ("Original DASPM"). The second ("Model 1") used the updated NSW population and severe treatment rate, with the care package allocations to residential rehabilitation reflecting the current NSW EOC data. Only the 18-64 years age group were modified in "Model 1" (EOC data could not be split into under 18 years and over 64 years, so these were retained as per original allocations). The third run ("Model 3"), applied the 1.5 multiplier to the residential rehabilitation care package allocations from the original DASPM (with the updated NSW population, the severe treatment rate at 100% and across all three age groups).

Table 8 summarises the residential rehabilitation care package allocations across the three runs ("Original"; "Model 1"; and "Model 2")

Table 8. Residential rehabilitation care package allocations (18-64 years)

	Original DASPM	Model 1 (NSW current EOC data)	Model 2 (current DASPM multiplied by 1.5)
Alcohol	8%	6%	12.0%
Amphetamine	9%	14%	13.5%
Opioid	3%	3%[1]	4.5%
Cannabis	9%	5%	13.5%

Note 1: EOC could not be calculated for opioids because OTP is collected in NOPSAD, not in the AODTS-NMDS. Therefore, the original DASPM allocation was used.

The allocations to the care packages need to sum to 100%. Therefore, when making changes to one care package, another change has to be made to another care package. The excess care package allocation that came from decreasing the residential rehabilitation care packages for alcohol and cannabis in Model 1 were added to the psychosocial care packages. On the other hand, the extra care package allocation in Model 2 (and for amphetamine in Model 1) was taken from the psychosocial care packages. Attachment 5 outlines the specific changes made to the residential rehab care packages (and in turn the psychosocial care packages) across the two models.

4. Results: Bed Number Estimates

Three estimates of the number of beds required to meet demand for alcohol and other drug treatment in NSW are given:

1. the original DASPM unmodified parameters with the exception of updated NSW population numbers and updated severity distribution (for amphetamine) and treatment rates (for amphetamine and opioids)
2. NSW Model 1, which updates the NSW population numbers and updates severity distribution and treatment rates (amphetamine and opioids), and modifies the care package allocation (18-64 years group only) based on EOC data

3. NSW Model 2, which updates the NSW population numbers and updates severity distribution and treatment rates (amphetamine and opioids), and multiplies the original DASPM resi rehab care package allocation by 1.5 across all age groups and all drugs (as informed by waiting data)

The total estimates (not broken down by age group) are given first (see Table 9). The total bed estimates for each of the models are: Original DASPM = 2,353 beds; Model 1 = 2,078 beds; Model 2 = 3,402 beds. Model 2 produced the highest bed estimate (informed by current waiting data for residential rehabilitation in NSW). While there is not much difference between the bed estimates for Original DASPM and Model 1 when looking at the TOTAL estimates, there are some important differences when examining each substance. Compared to Original DASPM, Model 1 bed estimates (which are based on EOC distributions) are lower for alcohol and cannabis, higher for amphetamine, and the same for benzodiazepines and opioids. The reason why there are differences between Original DASPM and Model 1 at the substance level (but not the TOTAL level) is because the substance level differences equal each other out when summed to give the TOTAL estimate.

In examining the estimates for each substance, the predicted bed numbers for people in demand of alcohol treatment are the highest - with a moderate amount of amphetamine, cannabis, and opioid beds predicted, and minimal benzo beds predicted. The Original DASPM for example, predicts a total of 2,353 beds – 57% (1,335 beds) of which are for alcohol treatment, 11% (254 beds) for amphetamine treatment, 14% (323 beds) for cannabis treatment, and 18% (428 beds) for opioid treatment (with 0.5% (12 beds) for benzodiazepine treatment).

Within each of the models, residential rehabilitation beds make up most of the predicted beds, with much smaller numbers of detox and inpatient beds predicted. Model 1 for example predicts a total of 2,078 beds – 83% (1,718 beds) of which are resi rehab beds, 14% (290 beds) detox, and 3% (70 beds) inpatient.

Table 9: Total Bed Numbers Predicted for NSW (across bed type, substance, and model)

Drug type	**Original DASPM**				**Model 1**				**Model 2**			
	Detox	Inpat	RR	Total	Detox	Inpat	RR	Total	Detox	Inpat	RR	Total
Alcohol	197	43	1,096	1,335	182	43	838	1,063	228	43	1,644	1,915
Amphetamine	24	3	227	254	32	3	349	384	32	3	340	375
Cannabis	33	4	287	323	24	4	163	191	42	4	430	476
Benzo	0	13	0	13	0	13	0	13	0	13	0	13
Opioid	51	9	368	428	51	9	368	428	63	9	552	624
TOTAL	305	70	1,977	2,353	290	70	1,718	2,078	366	70	2,967	3,402

Note: the bed numbers reported here are rounded. Total estimates are calculated by summing the non-rounded bed numbers.

Note: the opioid bed numbers should be treated with caution (see earlier). These were not re-parameterised in light of pharmaceutical opioids

Bed estimates were broken down across age-groups. As can be seen in Table 10, a vast majority of the beds predicted are for people in the 18-64 year age group.

Bed estimates were also broken down for each LHD in NSW (see Table 11). In predicting bed estimates for each LHD it is assumed that the only difference between the LHDs are population sizes – with potential differences in prevalence rates, severity distributions, and treatment rates not considered. The population sizes for each LHD are small, however, which means that any changes made to account for potential differences in prevalence rates, severity distributions, and/or treatment rates between the LHDs, will translate to minimal differences in bed predictions.

Table 10. Bed numbers predicted for NSW (across substance, bed type, model, and age group)

		12 – 17 years			18 – 64 years			65+ years		
		Original	Model 1	Model 2	Original	Model 1	Model 2	Original	Model 1	Model 2
Alcohol										
	Detox	1	1	2	186	171	216	10	10	10
	Inpatient	0	0	0	40	40	40	3	3	3
	Resi rehab	9	9	13	1,065	808	1,598	22	22	33
	Total	10	10	15	1,291	1,018	1,854	34	34	46
Amphetamine										
	Detox	1	1	1	23	31	31	0	0	0
	Inpatient	0	0	0	3	3	3	0	0	0
	Resi rehab	6	6	9	220	343	331	0	0	0
	Total	7	7	10	246	377	364	0	0	0
Benzodiazepine										
	Detox	0	0	0	0	0	0	0	0	0
	Inpatient	0	0	0	13	13	13	0	0	0
	Resi rehab	0	0	0	0	0	0	0	0	0
	Total	0	0	0	13	13	13	0	0	0
Cannabis										
	Detox	1	1	1	32	24	41	0	0	0
	Inpatient	0	0	0	3	3	3	0	0	0
	Resi rehab	7	7	11	279	155	419	0	0	1
	Total	8	8	12	315	182	463	1	1	1
Opioids										
	Detox	1	1	2	49	49	60	1	1	2
	Inpatient	0	0	0	9	9	9	0	0	0
	Resi rehab	10	10	15	355	355	532	3	3	4
	Total	12	11	17	412	412	601	4	4	6
Total										
	Detox	4	4	5	290	275	348	11	11	12
	Inpatient	0	0	0	67	67	67	3	3	3
	Resi rehab	32	32	48	1,920	1,661	2,880	25	25	38
	TOTAL	36	36	54	2,277	2,003	3,296	39	39	53

Note: the bed numbers reported here are rounded. Total estimates are calculated by summing the non-rounded bed numbers.

Table 11. Bed numbers predicted for each LHD in NSW (across substance, bed type, and model)

		Sydney			South Western Sydney			South Eastern Sydney			Illawarra Shoalhaven		
		Orig.	M1	M2	Orig.	M1	M2	Orig.	M1	M2	Orig.	M1	M2
Alcohol													
	Detox	18	17	21	24	22	28	25	23	28	10	9	11
	Resi rehab	104	79	155	134	102	200	137	105	206	54	41	81
	Inpatient	4	4	4	5	5	5	5	5	5	2	2	2
	Total	126	100	181	163	129	233	167	133	240	66	53	95
Amphetamine													
	Detox	2	3	3	3	4	4	3	4	4	1	2	2
	Resi rehab	21	33	32	28	43	42	28	44	43	11	17	17
	Inpatient	0	0	0	0	0	0	0	0	0	0	0	0
	Total	24	36	35	31	47	46	32	48	47	12	19	18
Benzodiazepine													
	Detox	0	0	0	0	0	0	0	0	0	0	0	0
	Resi rehab	0	0	0	0	0	0	0	0	0	0	0	0
	Inpatient	1	1	1	2	2	2	2	2	2	1	1	1
	Total	1	1	1	2	2	2	2	2	2	1	1	1
Cannabis													
	Detox	3	2	4	4	3	5	4	3	5	2	1	2
	Resi rehab	27	15	41	35	20	53	36	20	54	14	8	21
	Inpatient	0	0	0	0	0	0	0	0	0	0	0	0
	Total	31	18	45	40	23	58	40	24	60	16	9	23
Opioids													
	Detox	5	5	6	6	6	8	6	6	8	3	3	3
	Resi rehab	35	35	52	45	45	68	46	46	69	18	18	27
	Inpatient	1	1	1	1	1	1	1	1	1	0	0	0
	Total	40	40	59	52	52	77	53	53	78	21	21	31
Total													
	Detox	29	27	34	37	35	44	38	36	46	15	14	18
	Resi rehab	187	162	280	242	210	363	248	215	370	97	85	146
	Inpatient	7	7	7	9	9	9	9	9	9	3	3	3
	TOTAL	222	196	321	287	254	416	294	260	426	116	103	168

Note: the bed numbers reported here are rounded. Total estimates are calculated by summing the non-rounded bed numbers.

Table 11 (continued). Bed numbers predicted for each LHD in NSW (across substance, bed type, and model)

		Western Sydney			Nepean Blue Mountains			Northern Sydney			Central Coast		
		Orig.	M1	M2	Orig.	M1	M2	Orig.	M1	M2	Orig.	M1	M2
Alcohol													
	Detox	24	22	28	9	8	11	23	21	27	8	7	9
	Resi rehab	136	104	204	51	39	77	128	98	192	44	33	65
	Inpatient	5	5	5	2	2	2	5	5	5	2	2	2
	Total	165	131	237	62	49	89	156	124	224	53	42	76
Amphetamine													
	Detox	3	4	4	1	2	1	3	4	4	1	1	1
	Resi rehab	28	44	42	11	16	16	27	41	40	9	14	13
	Inpatient	0	0	0	0	0	0	0	0	0	0	0	0
	Total	32	48	47	12	18	18	30	45	44	10	15	15
Benzodiazepine													
	Detox	0	0	0	0	0	0	0	0	0	0	0	0
	Resi rehab	0	0	0	0	0	0	0	0	0	0	0	0
	Inpatient	2	2	2	1	1	1	2	2	2	1	1	1
	Total	2	2	2	1	1	1	2	2	2	1	1	1
Cannabis													
	Detox	4	3	5	2	1	2	4	3	5	1	1	2
	Resi rehab	36	20	54	13	8	20	34	19	50	11	6	17
	Inpatient	0	0	0	0	0	0	0	0	0	0	0	0
	Total	40	24	59	15	9	22	38	22	56	13	8	19
Opioids													
	Detox	6	6	8	2	2	3	6	6	7	2	2	3
	Resi rehab	46	46	69	17	17	26	43	43	65	15	15	22
	Inpatient	1	1	1	0	0	0	1	1	1	0	0	0
	Total	53	53	78	20	20	29	50	50	73	17	17	25
Total													
	Detox	38	36	45	14	13	17	36	34	43	12	12	15
	Resi rehab	246	213	368	92	80	138	231	201	346	79	68	118
	Inpatient	9	9	9	3	3	3	8	8	8	3	3	3
	TOTAL	292	258	422	110	97	159	275	243	397	94	83	135

Table 11 (continued). Bed numbers predicted for each LHD in NSW (across substance, bed type, and model)

		Hunter New England			Northern NSW			Mid North Coast			Southern NSW/Far West/Albury Wodonga[1]		
		Orig.	M1	M2	Orig.	M1	M2	Orig.	M1	M2	Orig.	M1	M2
Alcohol													
	Detox	22	20	25	7	6	8	5	5	6	7	6	8
	Resi rehab	121	96	181	38	29	57	27	21	41	38	29	58
	Inpatient	5	5	5	2	2	2	1	1	1	2	2	2
	Total	147	117	211	47	37	67	33	26	47	47	37	67
Amphetamine													
	Detox	3	4	3	1	1	1	1	1	1	1	1	1
	Resi rehab	25	38	37	8	12	12	6	9	8	8	12	12
	Inpatient	0	0	0	0	0	0	0	0	0	0	0	0
	Total	28	42	41	9	13	13	6	9	9	9	13	13
Benzodiazepine													
	Detox	0	0	0	0	0	0	0	0	0	0	0	0
	Resi rehab	0	0	0	0	0	0	0	0	0	0	0	0
	Inpatient	1	1	1	0	0	0	0	0	0	0	0	0
	Total	1	1	1	0	0	0	0	0	0	0	0	0
Cannabis													
	Detox	4	3	5	1	1	1	1	1	1	1	1	1
	Resi rehab	32	18	47	10	6	15	7	4	11	10	6	15
	Inpatient	0	0	0	0	0	0	0	0	0	0	0	0
	Total	36	21	52	11	7	16	8	5	12	11	7	17
Opioids													
	Detox	6	6	7	2	2	2	1	1	2	2	2	2
	Resi rehab	40	40	61	13	13	19	9	9	14	13	13	19
	Inpatient	1	1	1	0	0	0	0	0	0	0	0	0
	Total	47	47	69	15	15	22	11	11	15	15	15	22
Total													
	Detox	34	32	40	11	10	13	8	7	9	11	10	13
	Resi rehab	218	189	327	69	60	103	49	42	73	69	60	104
	Inpatient	8	8	8	2	2	2	2	2	2	2	2	2
	TOTAL	259	229	375	82	72	118	58	51	84	82	73	119

1: Far West and Albury Wodonga LHD have a population (12+) less than 100,000 people in total (12 years and older). Therefore, to ensure validity of the model, these two LHDs were combined with Southern NSW LHD to estimate bed numbers.

Table 11 (continued). Bed numbers predicted for each LHD in NSW (across substance, bed type, and model)

		Murrumbidgee			Western NSW		
		Orig.	M1	M2	Orig.	M1	M2
Alcohol							
	Detox	6	5	7	7	6	8
	Resi rehab	31	24	47	36	28	54
	Inpatient	1	1	1	1	1	1
	Total	38	30	54	44	35	63
Amphetamine							
	Detox	1	1	1	1	1	1
	Resi rehab	6	10	10	8	12	11
	Inpatient	0	0	0	0	0	0
	Total	7	11	11	8	13	12
Benzodiazepine							
	Detox	0	0	0	0	0	0
	Resi rehab	0	0	0	0	0	0
	Inpatient	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Cannabis							
	Detox	1	1	1	1	1	1
	Resi rehab	8	5	12	9	5	14
	Inpatient	0	0	0	0	0	0
	Total	9	5	13	11	6	16
Opioids							
	Detox	1	1	2	2	2	2
	Resi rehab	10	10	16	12	12	18
	Inpatient	0	0	0	0	0	0
	Total	12	12	18	14	14	21
Total							
	Detox	9	8	10	10	10	12
	Resi rehab	56	49	84	65	57	98
	Inpatient	2	2	2	2	2	2
	TOTAL	67	59	97	78	69	113

5. Contextualising bed estimates

In the process of working with the expert group, a number of points were raised to contextualise the findings, and which highlight implementation matters. These included:

- The model results do not suggest the specific location of services that are required
- There is a substantial concern for residential services for pregnant women. While the numbers of beds is for the total population (and hence inclusive of beds for pregnant women), the cost structure for these beds is fundamentally different to other rehab beds.
- Similarly, the model predicts numbers of beds for adults, but does not include the bed/accommodation needs of children staying with their parents. Nor does it account for the substantial amount of time clinical staff spend managing the relationship with FACS, ensuring supervised visits, etc
- Appropriate and affordable housing is a key problem, especially for clients leaving resi rehab services. There is limited supply of social housing and this results in extended stays within the residential rehab facility. If more social housing where available, a greater throughput could be achieved.
- The model does not accommodate rural/regional specific requirements, notably the higher costs (25%) for service provision in rural/regional eras
- The model does not accommodate care for Aboriginal and Torres Strait Islander people, nor the costs associated with that.

References

Begg, S., Vos, T., Barker, B., Stevenson, C., Stanley, L., & Lopez, A. D. (2007). The burden of disease and injury in Australia 2003.

Chalmers, J., Ritter, A., Heffernan, M., & McDonnell, G. (2009). *Modelling pharmacotherapy maintenance in Australia: Exploring affordability, availability, accessibility and quality using a system dynamics modelling approach*. Australian National Council on Drugs.

McKetin, R., McLaren, J., Kelly, E., Hall, W., & Hickman, M. (2005). *Estimating the number of regular and dependent methamphetamine users in Australia*. National Drug and Alcohol Research Centre (NDARC).

Attachments

Attachment 1: Drug and Alcohol Services Planning Model (DASPM) - Summary

The Drug and Alcohol Service Planning Model (DASPM) was developed between 2010 and 2013 by the NSW Ministry of Health (Mental Health and Drug and Alcohol Office) under a cost-shared funded project with the then Intergovernmental Committee on Drugs (IGCD). The aim of the project was to facilitate planning for alcohol and other drug services in Australia, and to provide a basis for national consistency in approaches to planning across all the Australian health jurisdictions. The specific objectives of the DASPM project were: to build the first national population based model for drug and alcohol service planning; to estimate the need and demand for treatment; to use clinical evidence and expert consensus to specify optimal care packages; and to calculate the resources needed to provide these care packages. An Expert Reference Group oversaw the development of the model. [1]

The model followed the principles of population-based planning used in the Mental Health Clinical Care and Prevention (MH-CCP) model of 2000 (NSW Centre for Mental Health, 2001; Pirkis et al., 2007). DASPM applied the prevalence of substance use disorders, by drug type and age group from epidemiological sources, incorporated a severity rating to distinguish mild, moderate and severe presentations and then used expert consensus (via the Expert Reference Group) to estimate the treatment rate. The treatment rate reflected the proportion of all those who met diagnostic criteria who would be suitable for, likely to seek, and benefit from, treatment in any one year (that is demand for treatment). Having divided the population (epidemiology of use disorders) into mild, moderate and severe, and established a treatment rate for each drug class and age category, the DASPM provides "care packages" for each drug class by age group by level of severity. These "care packages"[2] represent evidence-based and/or expert judgement regarding the care required for one year. Each care package specifies the types of services to be provided, and the workforce (staff hours) required to deliver that service. As a result, the DASPM produces the following outputs:

- The numbers of people suitable for, seeking and likely to benefit from treatment in any one year
- The service types required to meet that demand (eg number of beds, number of outpatient treatment places)
- The workforce required (number of medical, nursing, allied health and AOD workers)
- The resources required to deliver that level of care in line with the care packages specified in the model.

DASPM predictions of treatment demand rely on three key variables: the epidemiology (that is the prevalence of AOD disorders in the community), the severity distribution (the allocation of people with AOD disorders into three disability categories: mild, moderate and severe) and the treatment rates (the proportion of all people who would be suitable for, likely to seek, and benefit from treatment, given the appropriateness of the treatment services available). Each of these is discussed in turn.

The epidemiology

[1] The Expert Reference Group included: Alison Ritter (Chair), Robert Ali, Meredythe Crane, Robyn Davies, Sarah Gobbert, Anthony Sievers, Helene Delany, Dennis Gray, James Hunter, Susan Alarcon, Tania Murray, Robert Batey, Debbie Kaplan, Nick Lintzeris, Dan Lubman, Lynne Magor-Blatch, Liz Davis, Elise Newton, Ashleigh Lynch, Garth Popple, Anita Reimann, and Myra Brown.

[2] There are more than 100 different care packages in DASPM, broken down as they are by drug type, age group, and severity level.

The epidemiology for the model was based on the Australian Burden of Disease (AUSBoD) (Begg et al., 2007) which in turn relied largely on the 1997 National Survey of Mental Health and Wellbeing (NSMHWB) (Australian Bureau of Statistics, 1998a; Hall et al., 1999). The Composite International Diagnostic Interview (CIDI) was used as the interview tool to establish the rates of ICD-10 diagnoses of dependence and harmful use of alcohol, cannabis, sedatives, opioids, and stimulants. The last two classes (opioids and stimulants) are very low prevalence disorders in the general population, and general population surveys underestimate the prevalence of these drug classes (Degenhardt et al., 2011; Hall et al., 1999). DASPM therefore sought alternate epidemiology for heroin and stimulants (amphetamine).

The prevalence rates, their sources along with the actual population numbers (using the 2006 Australian population estimates taken from the Australian Bureau of Statistics (ABS) online publication *3222.0 – Population Projections, Australia, 2006 to 2101, Series B)* are given in Table 1.

Table 1: Past 12 month prevalence rates applied in DASP, associated data source and population, by drug type

Drug type	**18-64 yrs per 100,000 age-specific population**	**65+ yrs per 100,000 age-specific population**	**SUD pop 18-64 yrs**	**SUD pop 65 yrs +**	**Total SUD population (as at 2006)**	**Source for 12 month prevalence**
Alcohol	6.35%	1.42%	916,925	48,090	983,315	AUSBoD data from NSMHWB (See the AUSBoD report Begg et al., 2007, pp. Annex Table 2, p. 210).
Amphetamine	0.51%	0.01%	73,729	271	76,190	As reported in AUSBoD – used NMDS-AODT and a (McKetin, McLaren, Kelly, Hall, & Hickman, 2005) multiplier
Benzodiazepine	0.38%	0.08%	54,251	2,570	57,045	AUSBoD data from NSMHWB
Cannabis	1.76%	0.05%	254,661	1,725	264,734	AUSBoD data from NSMHWB
Opioids	0.65%	0.11%	94,506	3,619	98,660	(Chalmers, Ritter, Heffernan, & McDonnell,

		2009) Chalmers et al. multiplier
Total	**1,479,944**	

Severity distribution and treatment rate

DASPM distinguished between mild, moderate and severe disability. The division into mild, moderate and severe was facilitated by the available Australian data on disability weights from AUSBoD (Begg et al., 2007) which in turn relied on the SF12 measure of functioning. The proportion of those meeting diagnostic criteria who would fall within the severe disability category, using the AUSBoD disability weights, was calculated first and combined with existing research and expert judgement to divide the remaining numbers between mild and moderate disability.

The ratio of mild to moderate to severe for alcohol was 6:2:1 that is for every 6 people mildly disabled, there were 2 moderately disabled and 1 severely disabled (see Table 2). The same ratio was used for cannabis (6:2:1). For opioids no one was classed as mild or moderate (all were placed in the severe category). For amphetamines, no one was classed as mild, and for every 9 severely disabled, there was one moderately disabled. Lastly for benzodiazepines, for every 5 people classed as mild, 3 were classed as moderately disabled and 2 as severely disabled (5:3:2).

Table 2: DASPM severity distributions and treatment rates by drug class

		Severity distribution	**Treatment rate**
Alcohol			
	Mild	67%	20%
	Moderate	22%	50%
	Severe	11%	100%
Amphetamine			
	Mild	0%	0%
	Moderate	10%	50%
	Severe	90%	35%[a]
Benzodiazepine			

	Mild	50%	20%
	Moderate	30%	50%
	Severe	20%	100%
Cannabis			
	Mild	67%	20%
	Moderate	22%	50%
	Severe	11%	100%
Opioids			
	Mild	0%	0%
	Moderate	0%	0%
	Severe	100%	90%

Note a: The treatment rate for amphetamine was subject to substantial debate amongst the expert group, and while retained at 35% for severe, this number is able to be modified by DASPM end-users should they wish.

The treatment rates for each category of severity were established for DASPM based on existing research and the judgement of the Expert Reference Group. In the 1997 NSMHWB survey (Australian Bureau of Statistics, 1998b), 14% of those with substance use disorders had used services in the past year. A decade later, in the 2007 Australian NSMHWB survey (Slade et al., 2009), 24% of respondents with substance use disorders used treatment services in the last 12 months. The 2007 figure then informed the absolute minimum treatment rate for DASPM. In theory the maximum treatment rate would be 100% – that is everyone with mild, moderate and severe disability who meet diagnostic criteria for substance use disorder receive treatment. This is unrealistic for several reasons: 1. Spontaneous remission, or natural recovery is not uncommon (a proportion will never require treatment); 2. Some people will seek support for behaviour change through unfunded or informal means (such as mutual aid/self-help); 3. Some people will not find the AOD services an appropriate match for their needs; 4. Some people will not see the need for treatment and not seek care. Therefore, DASPM required expert judgements about treatment rates that incorporated these factors.

These expert judgements were informed by earlier research which noted an ideal treatment coverage of 51% for alcohol use disorders (70% for harmful use and 30% for dependence, see also (Andrews, Issakidis, Sanderson, Corry, & Lapsley, 2004). Subsequently the same team reduced this to an average of 38% (50% alcohol harmful use and 25% alcohol dependence) (Andrews et al., 2006). In light of the minimum rate of 24% and a possible optimal rate of 51% as an overall treatment rate

(across severity distribution), the experts deliberated over a series of meetings (having been provided with the above data along with current treatment rates) until consensus was reached amongst the group. The resultant treatment rates are given in Table 2. Thus, for example, for those with AUD at mild severity (which represents 67% of all AUD), there is a presumed treatment rate of 20%, whereas for those with a severe AUD (11% of all AUD), the treatment rate is 100%. When averaged across severity types, the treatment rate for alcohol was 35%, amphetamines 36%, benzodiazepines 45%, cannabis 35% and opioids 90%. It should be noted that there was substantial and sustained debate about the treatment rates in the DASPM Expert Reference Group.

The care packages

The care packages aimed to be comprehensive and to cover all possible evidence-based AOD service types. The full range of settings was included: primary care, specialist residential, outpatient, and day-patient. Having established the care packages, a further task was to distribute the people between the care packages. In some cases this was straightforward. For mild, there was only one care package (SBIRT) and hence all were allocated into that care package. For severe it becomes more complex: for the 18 to 65 year olds, alcohol use disorder, there were 14 different possible care packages. Again, a combination of existing data and expert judgement was used. Existing data (AIHW AODTS-NMDS) covered the current distribution of people between service types. The Expert Reference Group then reviewed those allocations and adjusted according to their expert judgement. For example, few people in Australia receive withdrawal (mainly due to access difficulties), whereas evidence and expert wisdom suggests that greater numbers should receive withdrawal, especially in the case of alcohol dependence.

Resource estimation

The resources counted within the model included: staffing time – which comprised direct contact time with patients, clinical administration, supervision and training; doses by medication type; number of beds and beddays; and number of diagnostic tests. Unit costs were used to specify the actual costs associated with each resource output. For example for medication doses, a unit cost per dose was established and used to derive the total costs associated with the model. This means that unit costs can be varied depending on the individual planning region circumstance (for example differences in average nurse salaries) without changing the quantum of the resource. Clearly the bulk of the resources are taken up with staff time (approximately 70%). The model specifies three different types of clinicians: medical doctors, nurses/allied health workers, and alcohol and drug counsellors. All direct patient care specified in the care packages was assigned to one of these three staff types. Thus the model output predicts the numbers of doctors working in either general practice or as addiction medicine specialists, nurses and allied health and alcohol and other drug counsellors that would be required to meet the needs of Australians with substance use disorders. The model does not specify who funds the services – its purpose is to predict resource requirements not to determine the funding bodies.

Putting it all together to get unmet demand

The estimate of unmet demand (200,000 to 500,000 people) was derived by taking the total demand estimate from the DASPM model, and then subtracting the numbers who had received treatment in the past year across Australia (Ritter et al., 2018).

Issues and limitations with DASPM:

1. More work has been done using DASPM to estimate unmet demand for treatment, but much less focus has been given to the care packages and almost no work using the resource estimation tool;
2. The epidemiology used in DASPM is very dated;
3. The treatment rates are subject to debate;
4. There is no 'geography' in the model, nor any weightings for rurality and so on. It assumes a typical town of 100,000 people applies across the whole of Australia. As a result it is very useful for national estimates, somewhat useful for some state based estimates and much less useful for local planning, unless modifications were made to include weightings for geography, and other local factors.
5. Getting to unmet demand involves a series of additional calculations for met demand, which are not necessarily straight forward (especially as DASPM includes mild disorders for which SBIRT is appropriate, but this inflates the total demand numbers).
6. While the tool is available in Excel it is very complicated to use and the technical manual is also complicated.

Attachment 2: Care package assignments for each drug, and by age group
Alcohol

12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	83.0%
12-17	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	6.0%
12-17	Withdrawal management - residential – with Pharmacotherapies – standard	2.0%
12-17	Withdrawal management - residential – with Pharmacotherapies – complex	2.0%
12-17	Rehabilitation – Day Program – 25 Days – Standard	2.5%
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	4.5%

18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	12.0%
18-64	Psychosocial Interventions - With Relapse Prevention Pharmacotherapies – Standard	12.0%
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	5.5%
18-64	Psychosocial Interventions – With Relapse Prevention Pharmacotherapies – Complex	5.5%
18-64	Withdrawal Management - Home Based - Without Relapse Prevention Pharmacotherapies – Standard	4.8%
18-64	Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	14.0%
18-64	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	4.8%
18-64	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Complex	10.0%
18-64	Withdrawal management - residential – with relapse prevention pharmacotherapies – complex	5.1%
18-64	Withdrawal Management - Residential – With Relapse Prevention Pharmacotherapies – Standard	11.7%
18-64	Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	5.6%
18-64	Rehabilitation – Day Program – 25 Days – Standard	1.0%
18-64	Residential Rehabilitation 8 Week Stay	2.5%
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	3.0%
18-64	Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	2.5%

65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	15.0%
65+	Psychosocial Interventions - With Relapse Prevention Pharmacotherapies – Standard	7.0%
65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	3.0%
65+	Psychosocial Interventions – With Relapse Prevention Pharmacotherapies – Complex	8.0%

65+	Withdrawal Management - Home Based - Without Relapse Prevention Pharmacotherapies – Standard	8.4%
65+	Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	8.4%
65+	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	8.4%
65+	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Complex	11.2%
65+	Withdrawal Management - Residential – With Relapse Prevention Pharmacotherapies – Standard	13.2%
65+	Withdrawal management - residential – with relapse prevention Pharmacotherapies – complex	6.0%
65+	Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	6.4%
65+	Rehabilitation – Day Program – 25 Days – Standard	2.0%
65+	Residential Rehabilitation 8 Week Stay	0.9%
65+	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	1.5%
65+	Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	0.7%

Amphetamine

12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	80.0
12-17	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	5.0
12-17	Withdrawal management - residential – with relapse prevention Pharmacotherapies – complex	5.0
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	10.0

18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	74.0
18-64	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	10.2
18-64	Withdrawal Management - Residential – With Relapse Prevention Pharmacotherapies – Complex	5.1
18-64	Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	1.7
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	9.0

65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	55.0
65+	Withdrawal Management - Daily Outpatient – With Relapse Prevention Pharmacotherapies – Standard	24.0
65+	Withdrawal Management - Residential – With Relapse Prevention Pharmacotherapies – Complex	16.0

65+	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	5.0

Benzodiazepine

12-17	Long Term Patient - Outpatient Stabilisation By 6 Months – Complex	100.0%

18-64	Long Term Patient - Outpatient Stabilisation By 6 Months – Complex	13.0%
18-64	Long Term Patient - Outpatient Stabilisation After 6 Months – Complex	72.0%
18-64	Long Term Patient - Inpatient Stabilisation By 6 Months – Complex	2.0%
18-64	Long Term Patient - Inpatient Stabilisation After 6 Months – Complex	13.0%

65+	Long Term Patient - Outpatient Stabilisation By 6 Months – Complex	15.0%
65+	Long Term Patient - Outpatient Stabilisation After 6 Months – Complex	85.0%

Cannabis

12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	53.0%
12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	22.0%
12-17	Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	11.4%
12-17	Withdrawal Management – Residential – Standard	4.2%
12-17	Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	1.4%
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	8.0%

18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	49.0%
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	21.0%
18-64	Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	12.6%
18-64	Withdrawal Management – Residential – Standard	6.3%
18-64	Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	2.1%
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	9.0%

65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	56.0%
65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	22.0%
65+	Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	12.0%
65+	Withdrawal Management – Residential – Standard	8.0%

65+	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	2.0%

Opioids

12-17	Patients Registered In Opioid Substitution Treatment Programs – Complex	20.0%
12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	30.0%
12-17	Withdrawal Management - Daily Outpatient– Complex	15.0%
12-17	Withdrawal Management – Residential – Complex	15.0%
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	20.0%

18-64	Patients Registered In Opioid Substitution Treatment Programs – Standard	49.0%
18-64	Patients Registered In Opioid Substitution Treatment Programs – Complex	21.0%
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	10.5%
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	4.5%
18-64	Withdrawal Management - Daily Outpatient - Without Relapse Prevention Pharmacotherapies – Standard	4.0%
18-64	Withdrawal Management - Daily Outpatient– Complex	1.2%
18-64	Withdrawal Management – Residential – Standard	2.5%
18-64	Withdrawal Management – Residential – Complex	1.1%
18-64	Withdrawal Management – Drug And Alcohol Hospital Bed – With Relapse Prevention Pharmacotherapies	1.2%
18-64	Rehabilitation – Day Program – 25 Days – Standard	1.7%
18-64	Residential Rehabilitation 8 Week Stay	1.0%
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	1.7%
18-64	Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	0.2%
18-64	Residential rehabilitation – 16 week stay, 12 weeks of after care/transition/re-entry/transition/re-entry, 13 week of exit program/outclient in the community - methadone to abstinence residential (mtar)	0.2%
18-64	Residential rehabilitation – 16 week stay, 12 weeks of after care/transition/re-entry, 15 weeks of exit program/outclient stay, 5 weeks of exit program in the community - residential treatment for heroin dependence stabilisation program (rtod)	0.2%

65+	Patients Registered In Opioid Substitution Treatment Programs – Complex	90.0%
65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	5.0%
65+	Withdrawal Management – Residential – Complex	4.0%
65+	Residential Rehabilitation 8 Week Stay	1.0%

Attachment 3: Waiting figures provided by the expert group

Table 6. Waiting list data provided by the expert group

	Number of people waiting	Number of beds available
	20	16
	32	22
	15	9
	35	18
	44	22
	22	7
	118	36
	56	13
	150	24
Total	492	167

Attachment 4: Process for calculating how many more resi rehab beds are needed to treat people on waiting lists

Assumptions:

- Each person on a waiting list requires 90 resi rehab beddays
- Occupancy rate of 75%
- 167 beds available

Steps of calculation:

- 246 people on the waiting list, and these people require 22,140 beddays (246 x 90)
- Occupancy rate of 75%, so 1 bed makes available 273.75 beddays per year (365 x 0.75)
- Divide how many more beddays we need (22,140) by how many beddays each bed offers (273.5) and we get an estimate of how many more beds are needed – which equals 81.
- Currently there are 167 resi rehab beds available. We need to supply 81 more to treat people on the waiting list. Therefore, for resi rehab bed supply to match demand we need to supply 248 beds (167+81).
- To get to 248 beds we need to multiply the current supply of 167 beds by 1.5.

Attachment 5: Modifications made to care package allocations in model 1 and model 2 (as compared to original DASPM)

Alcohol

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Standard	83.0	83.0	80.75
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	4.5	4.5	6.75

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	5.5	6.5	3.5
18-64	Psychosocial Interventions – With Relapse Prevention Pharmacotherapies – Complex	5.5	6.5	3.5
18-64	Residential Rehabilitation 8 Week Stay	2.5	2.0	3.75
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	3.0	2.0	4.5
18-64	Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	2.5	2.0	3.75

Age group	Model 1 (Original DASPM)	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
65+	Psychosocial Interventions – With Relapse Prevention Pharmacotherapies – Complex	8.0	8.0	6.40
65+	Residential Rehabilitation 8 Week Stay	0.9	0.9	1.35
65+	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	1.5	1.5	2.25
65+	Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	0.7	0.7	1.05

Amphetamine

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	80.0	80.0	75.0
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	10.0	10.0	15.0

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	74.0	69.0	69.5
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	9.0	14.0	13.5

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	55.0	55.0	52.5
65+	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	5.0	5.0	7.5

Benzodiazepine

NO CHANGES MADE

Cannabis

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	22.0	22.0	18.0
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	8.0	8.0	12.0

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	21.0	25.0	16.5
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	9.0	5.0	13.5

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	22.0	22.0	21.0
65+	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	2.0	2.0	3.0

Opioids

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
12-17	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	30.0	30.0	20.0
12-17	Residential Rehabilitation – 18 Week Stay + 13 Weeks Aftercare In Community	20.0	20.0	30.0

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
18-64	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	4.5	4.5	2.85
18-64	Residential Rehabilitation 8 Week Stay	1.0	1.0	1.5
18-64	Residential rehabilitation – 13 week stay, 13 weeks aftercare and 13 weeks outclient program	1.7	1.7	2.55
18-64	Residential rehabilitation – 26 week stay, 13 weeks of after care/transition/re-entry and 10 weeks outclient program	0.2	0.2	0.3
18-64	Residential rehabilitation – 16 week stay, 12 weeks of after care/transition/re-entry/transition/re-entry, 13 week of exit program/outclient in the community - methadone to abstinence residential (mtar)	0.2	0.2	0.3
18-64	Residential rehabilitation – 16 week stay, 12 weeks of after care/transition/re-entry, 15 weeks of exit program/outclient stay, 5 weeks of exit program in the community - residential treatment for heroin dependence stabilisation program (rtod)	0.2	0.2	0.3

Age group	Care Package	Original DASPM	Model 1 (based on EOC data)	Model 2 (original multiplied by 1.5)
65+	Psychosocial Interventions – Without Relapse Prevention Pharmacotherapies – Complex	5.0	5.0	4.5
65+	Residential Rehabilitation 8 Week Stay	1.0	1.0	1.5