

# Challenging the perceptions of cancer service provision for the disadvantaged: evaluating utilisation of cancer support services in Western Australia

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## Abstract

**Purpose** The main aim of the study was to evaluate the distributive utilisation of services provided by the Cancer Council of Western Australia according to age, social disadvantage and geographic location. Results were used to determine if social justice principles in terms of service provision were upheld.

**Methods** Cross-sectional study design to evaluate utilisation of cancer support services over a 12-week period in 2007 using administrative records. Service utilisation incidence rates (population information obtained from de-identified cancer registry data) and incidence rate ratios were calculated by gender, age group, cancer type, socioeconomic status and location.

**Results** The Information services (52%,  $n=4,932$ ) were the most popular Cancer Council of Western Australia (CCWA)

services followed by Emotional Support services (21%,  $n=2,045$ ). All CCWA services were more likely to be accessed by those with a lower socioeconomic status, except for Clinical Services. The rate of utilisation for patients with cancer in the 65+ years age group was found to be under-served relative to the 40–64 years age group.

**Conclusions** Overall, the study has shown that CCWA services are not provided uniformly (horizontal equity) across strata of socio-economic status. Given that the prevalence of cancer generally increases with socio-economic advantage, the findings were notable in regard to one particular outcome. Results for age indicate that there may be some underlying accessibility issues for the aged population. The findings are consistent with current literature highlighting issues of disadvantage in regard to the ability of elderly persons with cancer to access services and support.

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## Introduction

Achieving social justice in the public health context essentially means a fair and just distribution of the opportunity to achieve optimal health. Hence, in the administration of health services, evaluating service delivery to the population is an essential process in ensuring social justice. A core objective of the process is to ensure that equity in the use of services is achieved. Social disadvantage and disadvantage based on accessibility to services are two factors that have been acknowledged to be associated with inequity in health in many developed countries including Australia [1, 2]. Specific to cancer services, evidence indicates that low socio-

economic status is associated with less than ideal treatment patterns which can compromise the quality of care received and lead to poor survival outcomes [3–6]. Clients from rural and remote areas have limited access to appropriate cancer services caused by geographic isolation, poor transport links, shortage of health care providers and an overall lower socio-economic status [4–6]. These findings highlight the need for the evaluation of health services to ensure that equal opportunity to use health services and thus optimal health is achieved.

The Australian state of Western Australia (WA) is over 2.5 million square kilometres in size over 3.5 times the size of Texas with approximately 690,000 square kilometres [7, 8]. WA has a centralised population around the capital city of Perth in the south-western corner of the state (approximately 75% of the state population) [9]. This population distribution leaves people in rural and remote areas of WA far more isolated than in most other developed nations. The Cancer Council of Western Australia (CCWA) is a voluntary cancer support service that aims to provide equitable provision of services to the population of WA [10]. CCWA places additional value in providing services for patients and carers located outside the Perth metropolitan area in order to address the unmet need for services in these areas [10].

Since equity can be defined in two ways, it is important to recognise its meaning in relation to the above statement. Horizontal equity is defined as equal treatment for equal need (where need usually means clinical need), thus equitable provision of services using this definition would infer equal utilisation by all individuals who have been diagnosed with cancer regardless of social or other status [11–13]. However, vertical equity is defined as unequal treatment for equal need, thus using this definition, some segments of the population would receive extra services [11–13]. The principles of vertical equity are often adhered to by proponents of social justice such as support service agencies, since their aim is to provide additional help for otherwise disadvantaged segments of the population.

For the purposes of this study, the principle of vertical equity will be used when interpreting if the results support the aims of the CCWA. The objective of this study was to evaluate the distributive utilisation of services provided by the CCWA according to age, social disadvantage and geographic location to determine if social justice principles in terms of service provision were upheld.

## Methods

### Data collection

The study used a cross-sectional design to conduct an evaluation of the utilisation of cancer support services

provided by the CCWA. During a 12-week period from 5th of February 2007 to 29th of April 2007 the frequency of use of 11 cancer support services were obtained by staff of the CCWA using administrative records. The services were accommodation, breast prosthesis, cancer helpline, complementary, counselling services, diversional/creative activity, financial services, lymphoedema management, support coordinators, support groups and wig library.

The data were recorded onto a standard data collection instrument for each service, transcribed and forwarded to the researchers in electronic format. Strict exclusion or inclusion criteria were not established prior to data collection because the data collection instrument was originally intended for administrative purposes. Thus all episodes of service were recorded and information was only collected where it was usual practice to record such data. In keeping with the research objective, the sample population was subsequently limited to the study population of WA residents only, as determined by the identification of a WA postcode.

Information pertaining to the person requesting the service recorded by the CCWA staff included postcode of usual residence, age (in years), gender, cancer type (where it was appropriate and normal practice to ask) and client type. Support coordinators additionally provided service type (information, emotional or practical).

### Client-type categories

Clients were classified into categories depending upon the service. For the majority of services, clients were classified as either a carer or a patient (includes those currently seeking medical treatment and those with a history of cancer). However, episodes of service pertaining to the cancer helpline and counselling services were not restricted to these two categories. Additional categories, namely, patient, general public, spouse (counselling services only), relative/friend, health professional (cancer helpline only), community organisation (cancer helpline only) or other (cancer helpline only) were recorded for these two services. These additional categories were subsequently aggregated into three (carer, patient or other) so that all the data could be analysed consistently.

### Categorisation into service types

To simplify the analysis, CCWA services were grouped according to five major needs based on service types. Support coordinator records were already designated as providing information, emotional and/or practical information based upon the coding of the service type provided in the data. All other records were grouped into one of five service types on the basis of the service after liaison with the Director of the Cancer Services Division. These

categories were pre-defined by the Cancer Council WA as information, emotional support, practical support, spiritual and wellness and clinical and physical services. Although records pertaining to the Cancer Helpline may also have been able to be divided into different needs, this service could not be separated into groups because the relevant information was not provided.

#### Population denominator data

In this study, data pertaining to those in the general population of WA who had a previous diagnosis of cancer (prevalent cancer population) was utilised as the population denominator. The prevalent cancer population data consisted of a de-identified data set containing information on the number of individuals currently living with cancer in WA stratified by age (currently and not at time of diagnosis), sex, postcode (place of usual residence) and cancer type (most recently diagnosed type) obtained from the Western Australian Cancer Registry (WACR) [14]. Age was aggregated into four age groups (0–14, 15–39, 40–64 and 65+ years) and cancer type was categorised as breast, colorectal, lung, prostate or other.

#### Categorisation by age group

All CCWA records which contained the age of the person requesting the service were categorised into one of four groups ((0–14, 15–39, 40–64 and 65+ years). It should be noted here that data pertaining to the cancer helpline did not have any age information present; therefore, this service was excluded from all analyses by age. The choice of age grouping for the study was limited by those provided by the WACR for the prevalent cancer population data.

#### Categorisation by socio-economic status

The postcode recorded on each CCWA record was matched to the appropriate 2001 WA socio-economic index for area (SEIFA) quintile of relative disadvantage using an index file obtained from the Australian Bureau of Statistics (ABS) CDATA collection [15]. This process was repeated for the WACR data set so that the prevalent cancer population could also be categorised by socio-economic status.

#### Categorisation by location

The postcode recorded on each of the CCWA records and the WACR data sets was used to profile the data by location in two ways as shown below:

##### 1. Health district

##### 2. Broad location (metropolitan rural or remote)

Data allocating postcodes into location categorisation schemes above were obtained from the WA Department of Health's Epidemiology Branch website and are the categorisations used by the WA Department of Health [16].

In addition to data files containing the postcodes assigned to each category of location, maps partitioning WA by each categorisation system were also acquired from the WA Department of Health's Epidemiology Branch website. These maps were subsequently digitally manipulated so that the results of the analyses could be displayed appropriately.

For each map, the rate of utilisation of services was aggregated into quintiles representing successive increments of 20% (0–20% through to 81–100%) of the range of utilisation observed within each geographic area. The quintiles were formed using the minimum and maximum rates observed in each of the three respective types of location independently.

The relative distribution of utilisation was displayed on a map of WA with each region colour-coded, depending upon the utilisation quintile (lowest through to highest).

#### Calculation of incidence rates and rate ratios

Utilisation of CCWA services was evaluated by means of incidence rates and rate ratios. Incidence rates were used to provide an absolute value of utilisation, whereas rate ratios were used to give a relative measure of utilisation for all strata (e.g. different age groups) compared to a predefined baseline stratum. Thus rate ratios were used to provide an overview of both the trend and magnitude of variation in utilisation across strata within each socio-demographic factor evaluated.

#### Calculation of the incidence rate of CCWA service utilisation

Incidence rates were calculated using the conventional formula as shown below.

$$\frac{\text{Number of events observed within the population under consideration}}{\text{Person time at risk within the population under consideration}}$$

The number of events was taken from the CCWA data, and the person time at risk was calculated from the prevalent cancer population data. Since incidence rates are conventionally expressed per person years, due to the collection period being less than 1 year (12 weeks), the person time at risk derived from the population data was scaled such that each person contributed 0.23 person years to the denominator.

When calculating the incidence rates, only patients were included because of a numerator–denominator mismatch. The numerator (CCWA data) included demographic information about the caller, whereas the denominator (prevalent cancer population data) pertained to the cancer patient themselves. Therefore, carers needed to be excluded from the numerator because there was no information pertaining to carers in the denominator. For example, the carer information could give an age of 35 years and a sex as female, whereas the cancer patient that this carer should be identified with may be aged 75 and male.

The incidence rate of CCWA service utilisation was evaluated with respect to the following socio-demographic factors: gender, age group, socio-economic status, broadly defined geographic location (metro, rural and remote), health district and statistical local area as appropriate.

#### Calculation of rate ratios

As explained above, rate ratios are a useful relative measure of utilisation since they provide an overview of the trend and magnitude of any differences in utilisation across strata within a specific factor under analysis.

Rate ratios were calculated as shown below:

#### Incidence rate of stratum under investigation

##### Incidence rate of the baseline stratum

Rate ratios give a value between 0 and infinity, where the baseline stratum has a value of 1.00. Thus rate ratios lower than 1.00 signifies a utilisation rate below that of the baseline, and rate ratios higher than 1.00 signify a utilisation rate higher than that of the baseline. The magnitude of the difference between and stratum under evaluation and the baseline is determined to be the magnitude of the difference between the two rate ratios where 1.5 would represent a 50% increase in utilisation and 0.5 would represent a 50% decrease in utilisation.

Choice of the baseline stratum is arbitrary; however, by convention, either the stratum with the highest or lowest utilisation is chosen, except where a natural order exists (the middle stratum is often used) or the stratum is an obvious outlier.

For this study, the following strata were used as the baseline:

- Age group: 15–39 years (since the youngest age group had minimal utilisation)
- Socio-economic status: Average (the middle group)
- Health district: Perth city (when missing Central was used)
- Broad location: Metro

## Results

The study found utilisation of CCWA services varied according to age, socio-economic status and geographic location. Table 1 presents the number and proportion of occasions of service delivered during the period between the 5th February and the 29th April 2007 for 11 core services, totalling 9,077. Approximately 76% of the records belonged to females and 24% to males. The majority (47%) of records pertained to helpline services with the support coordinators comprising 20% of records. Table 1 also includes the occasions of service broken down by five service types and gender, totalling 9,549. Females contributed 75% of these records, and overall, 52% of occasions for information support, 21% from emotional support and 17% practical support.

Table 2 shows the rate and rate ratio of CCWA service utilisation for all individuals with cancer, where the rate of utilisation for patients with cancer in the 65+ years age group was found to be under-serviced relative to the 40–64 years age group (1,785 and 3,109 occasions of use per 10,000 person years, respectively, for males and females combined) and was more pronounced in females than males. When considered as a rate ratio between the older age groups and the 15–39 year group, the service utilisation of the 65+ years group is statistically significantly less for males (0.76), females (0.68) and the combined ratio (0.67).

Table 2 also presents the utilisation rate and rate ratio for patients diagnosed with cancer broken down by broad service type by age group. Clinical services only presented a statistically significant difference in rate ratio for the 40–64 years group with 2.7 times the utilisation in comparison to the 15–39 year reference rate. The only statistically significant rate ratio for emotional services was the under-utilisation by the 65+ years group of 0.6 the rate of use by the 15–39 years age group. There were no significant rate ratio differences for information services, practical services and spiritual services by age groups.

With respect to socio-economic status, this study found that with the exception of clinical services, utilisation of CCWA services followed a pattern of increasing service utilisation with decreasing advantage. Table 3 presents the utilisation rate and rate ratio for each gender and combined by socio-economic quintile in patients diagnosed with cancer. There is an increased rate ratio for utilisation of all services in both males and females for the extremely disadvantaged quintile in comparison to the average quintile (2.1 and 1.3, respectively). There is a steady decline from the extremely disadvantaged to the extremely advantaged quintile in all service rate and rate ratio (all are statistically significant except for the disadvantaged compared to the average). This trend of increasing utilisation with decreasing socio-economic status is consistent in each of the service-type groups except for clinical services where

**Table 1** Number and proportion of occasions of core services and service type delivered by gender during study period

	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Core services						
Accommodation	277	13	342	5	619	7
Breast prosthesis	0	0	181	3	181	2
Cancer helpline	767	35	3,456	50	4,223	47
Complementary	48	2	419	6	467	5
Counselling services	89	4	164	2	253	3
Diversional/creative activity	22	1	103	1	125	1
Financial services	149	7	161	2	310	3
Lymphoedema management	45	2	283	4	328	4
Support coordinators	676	31	1,173	17	1,849	20
Support groups	103	5	426	6	529	6
Wig services	0	0	193	3	193	2
<b>All services</b>	2,176	24	6,901	76	9,077	100
Service type						
Practical support	547	23	1,105	15	1,652	17
Emotional support	672	29	1,373	19	2,045	21
Information support	1,009	43	3,923	54	4,932	52
Spiritual and wellness	70	3	522	7	592	6
Clinical and physical	45	2	283	4	328	3
<b>Total</b>	2,343	25	7,206	75	9,549	100

the trend is reversed. The extremely advantaged quintile has 1.6 times the rate of utilisation than the average quintile, whilst the extremely disadvantaged quintile is only 0.7 and not statistically significant.

This study found that CCWA services were used to a greater extent by individuals living in less accessible areas of WA. Figure 1 displays a map of Western Australia broken into three general geographical areas: metro, rural and remote. For all services, there is a distinct trend from a relatively low overall CCWA service utilisation in the metro area to an average relative utilisation in the rural area and a relatively highest utilisation for the remote zone. In examining the trend for each service type, the clinical services are again the only group to not follow the basic trend of increasing utilisation with increasing remoteness. The clinical services are most highly utilised in the metro area, and low and lowest utilisation are observed for rural and remote, respectively.

Evaluation of utilisation across health districts; however, found that not all districts within remote locations had high rates of utilisation. Figure 2 shows certain districts had particularly high utilisation, whilst other areas had utilisation significantly lower compared to metro health districts. Interestingly, a rural health district called Geraldton showed consistently higher utilisation compared with all its surrounding health districts. This trend of increased utilisation with increasing remoteness was consistent across many

service types, with the notable exception of clinical services where the reverse trend was observed.

## Discussion

This study has found that utilisation of CCWA services varies according to age, socio-economic status and geographic location. With respect to age, there was an observation of inequity which may be worth for further evaluation by the CCWA. It appears that those widely recognised as generally more able and willing to access services (i.e. younger individuals <65 years) are the predominant users of CCWA services, whilst potentially more vulnerable segments of the WA population (those over 65+) may be under-served. A number of studies have indicated that elderly sectors of the population are under-served in terms of cancer treatments and services [17]. There are a number of highlighted reasons in the literature which indicate why this may be the case. Firstly, it is speculated that elderly cancer patients often prefer to obtain their information directly from their clinician [18, 19] and would therefore tend to seek out secondary sources of information, such as self-help groups, less often. They may also be less willing and accustomed to exploring information pertaining to cancer treatments and management



**Table 2** Rate and rate ratio of utilisation for all CCWA services of all individuals in WA diagnosed with cancer

	Age group (year)	Records (n)	PYR <sup>a</sup>	Rate <sup>b</sup> /10,000 PYR <sup>c</sup>	95% CI <sup>d</sup>		Rate ratio	95% CI <sup>f</sup>	
					LL	UL		LL	UL
All services									
Males	0–14	0	46	0	0	0	0	0	0
	15–39	63	444	1,419	1,069	1,770	1 <sup>e</sup>		
	40–64	451	2,742	1,645	1,493	1,796	1.16	0.89	1.51
	65+	484	4,458	1,086	989	1,182	0.76 <sup>c</sup>	0.59	0.99
Females	0–14	1	36	279	–268	825	0.07 <sup>c</sup>	0.01	0.52
	15–39	181	470	3,852	3291	4,413	1 <sup>e</sup>		
	40–64	1497	3,524	4,248	4033	4,463	1.1	0.95	1.29
	65+	987	3,781	2,611	2448	2,773	0.68 <sup>c</sup>	0.58	0.79
Combined	0–14	1	82	122	–117	360	0.05 <sup>c</sup>	0.01	0.33
	15–39	244	914	2,670	2,335	3005	1 <sup>e</sup>		
	40–64	1948	6,266	3,109	2,971	3247	1.16	1.02	1.33
	65+	1471	8,239	1,785	1,694	1877	0.67 <sup>c</sup>	0.58	0.77
Clinical services	0–14	0	82	0	0	0	0	0	0
	15–39	9	914	98	34	163	1 <sup>e</sup>		
	40–64	168	6,266	268	228	309	2.7 <sup>c</sup>	1.4	5.3
	65+	144	8239	175	146	203	1.8	0.9	3.5
Emotional services	0–14	0	82.1	0	0	0	0	0	0
	15–39	105	913.8	1,149.1	929.3	1368.8	1 <sup>e</sup>		
	40–64	789	6,266.1	1,259.2	1,171.3	1347	1.1	0.9	1.3
	65+	556	8,238.8	674.9	618.8	730.9	0.6 <sup>c</sup>	0.5	0.7
Information services	0–14	1	82.1	121.8	–116.9	360.5	0.3	0	1.8
	15–39	44	913.8	481.5	339.2	623.8	1 <sup>e</sup>		
	40–64	239	6,266.1	381.4	333.1	429.8	0.8	0.6	1.1
	65+	198	8,238.8	240.3	206.9	273.8	0.5	0.4	0.7
Practical services	0–14	0	82.1	0	0	0	0	0	0
	15–39	101	913.8	1,105.3	889.7	1320.8	1 <sup>e</sup>		
	40–64	639	6,266.1	1,019.8	940.7	1098.8	0.9	0.7	1.1
	65+	571	8,238.8	693.1	636.2	749.9	0.6	0.5	0.8
Spiritual services	0–14	0	82.1	0	0	0	0	0	0
	15–39	17	913.8	186	97.6	274.5	1 <sup>e</sup>		
	40–64	287	6,266.1	458	405	511	2.5	1.5	4
	65+	136	8,238.8	165.1	137.3	192.8	0.9	0.5	1.5

<sup>a</sup> Person years<sup>b</sup> Rate of utilisation of CCWA services<sup>c</sup> Statistically significant result<sup>d</sup> 95% Confidence interval of the rate of utilisation of CCWA services<sup>e</sup> Reference group for rate ratio calculation<sup>f</sup> 95% Confidence interval of the rate ratio

thereof which may be outside the regimen suggested by the physician [19, 20]. In addition, some of the supportive services offered may not be perceived by elderly cancer patients as relevant for them such as body image issues and embarking on a physical activity and fitness program.

Some literature indicates that acceptance of cancer diagnosis and prognosis is related to the age of the cancer patient

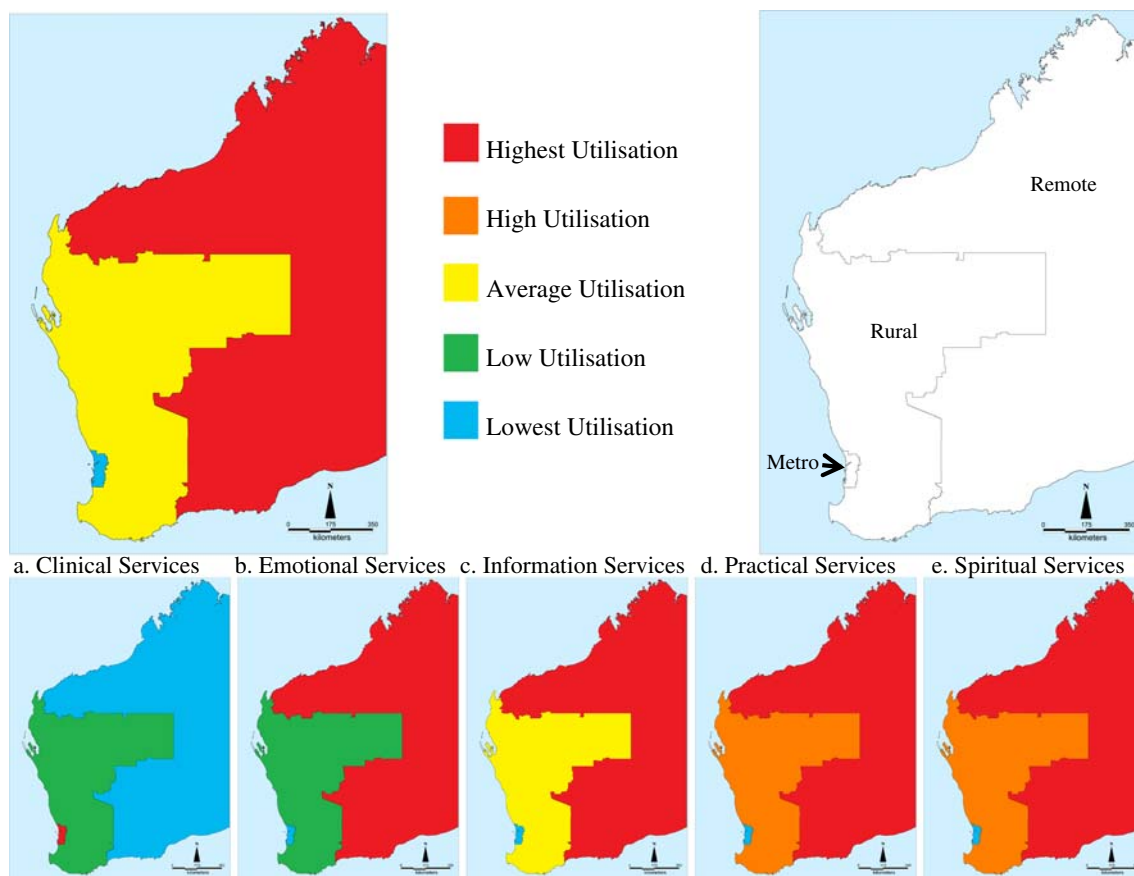
[21]. Some studies have indicated that older cancer patients have a more resigned approach to a diagnosis of cancer termed ‘cancer fatalism’ by [22]. In other words, they have already led a ‘full life’ and are more accepting of cancer as another illness that is a potentially accepted part of growing old [21]. These considerations require tailoring of supportive and counselling services for elderly persons with cancer.

**Table 3** Rate and rate ratio of utilisation for all CCWA services of all individuals in WA diagnosed with cancer according to socio-economic status

	SES	Records (n)	PYR <sup>a</sup>	Rate <sup>b</sup> /10,000 PYR <sup>c</sup>	95% CI <sup>d</sup>		Rate ratio	95% CI <sup>f</sup>	
					LL	UL		LL	UL
All services									
Males	Extremely disadvantaged	415	1,360	3,051	2,757	3,345	2.1	1.8	2.5
	Disadvantaged	261	1,459	1,788	1,571	2,005	1.2	1	1.5
	Average	195	1,346	1,449	1,245	1,652	1 <sup>e</sup>		
	Advantaged	150	1,633	918	771	1,065	0.6	0.5	0.8
	Extremely advantaged	99	1,775	558	448	668	0.4	0.3	0.5
Females	Extremely disadvantaged	833	1,368	6,090	5,676	6,504	1.3	1.2	1.5
	Disadvantaged	703	1,477	4,759	4,408	5,111	1	0.9	1.1
	Average	646	1,402	4,608	4,253	4,964	1 <sup>e</sup>		
	Advantaged	550	1,623	3,389	3,106	3,672	0.7	0.7	0.8
	Extremely advantaged	574	1,844	3,113	2,858	3,368	0.7	0.6	0.8
Combined	Extremely disadvantaged	1248	2,728	4,575	4,321	4,829	1.5	1.4	1.6
	Disadvantaged	964	2,936	3,283	3,076	3,490	1.1	1	1.2
	Average	841	2,748	3,061	2,854	3,267	1 <sup>e</sup>		
	Advantaged	700	3,256	2,150	1,990	2,309	0.7	0.6	0.8
	Extremely advantaged	673	3,619	1,860	1,719	2,000	0.6	0.5	0.7
Clinical services	Extremely disadvantaged	40	2,728	147	101	192	0.7	0.5	1
	Disadvantaged	39	2,936	133	91	174	0.6	0.4	0.9
	Average	58	2,748	211	157	265	1 <sup>e</sup>		
	Advantaged	60	3,256	184	138	231	0.9	0.6	1.3
	Extremely advantaged	119	3,619	329	270	388	1.6	1.1	2.1
Emotional services	Extremely disadvantaged	484	2,728	1,774	1,616	1,932	2	1.7	2.3
	Disadvantaged	294	2,936	1,001	887	1,116	1.1	0.9	1.3
	Average	248	2,748	903	790	1,015	1 <sup>e</sup>		
	Advantaged	200	3,256	614	529	699	0.7	0.6	0.8
	Extremely advantaged	184	3,619	508	435	582	0.6	0.5	0.7
Information services	Extremely disadvantaged	339	2,728	1,243	1,110	1,375	1.3	1.1	1.5
	Disadvantaged	236	2,936	804	701	906	0.8	0.7	1
	Average	262	2,748	953	838	1,069	1 <sup>e</sup>		
	Advantaged	245	3,256	752	658	847	0.8	0.7	0.9
	Extremely advantaged	232	3,619	641	559	724	0.7	0.6	0.8
Practical services	Extremely disadvantaged	341	2,728	1,250	1,117	1,383	1.2	1	1.4
	Disadvantaged	316	2,936	1,076	957	1,195	1	0.9	1.2
	Average	293	2,748	1,066	944	1,188	1 <sup>e</sup>		
	Advantaged	202	3,256	620	535	706	0.6	0.5	0.7
	Extremely advantaged	129	3,619	356	295	418	0.3	0.3	0.4
Spiritual services	Extremely disadvantaged	151	2,728	554	465	642	2.1	1.6	2.8
	Disadvantaged	122	2,936	415	342	489	1.6	1.2	2.1
	Average	73	2,748	266	205	327	1 <sup>e</sup>		
	Advantaged	58	3,256	178	132	224	0.7	0.5	0.9
	Extremely advantaged	35	3,619	97	65	129	0.4	0.2	0.5

SES Socio-economic status

<sup>a</sup> Person years<sup>b</sup> Rate of utilisation of CCWA services<sup>c</sup> Statistically significant result<sup>d</sup> 95% Confidence interval of the rate of utilisation of CCWA services<sup>e</sup> Reference group for rate ratio calculation<sup>f</sup> 95% Confidence interval of the rate ratio



**Fig. 1** Relative service utilisation for all services and by service type across broad geographical location for patients diagnosed with cancer

The findings showed that clinical services are most highly utilised in the metro area and the low and lowest utilisation are observed for rural and remote areas, respectively. In regard to the trends for utilisation of clinical services, it is noteworthy that clinical services do not follow the basic trend of increasing utilisation with increasing remoteness. Provision of clinical services within Western Australia are historically difficult, given geographic locations and issue around staffing and resources [23–25]. Provision of cancer services are further compromised amongst rural and remote indigenous Australians, with a review by Cunningham et al. [26] noting that data from a national survey showed that 12% of indigenous Australians surveyed reported difficulties in getting transportation for accessing cancer services compared to 4% for non-indigenous Australians.

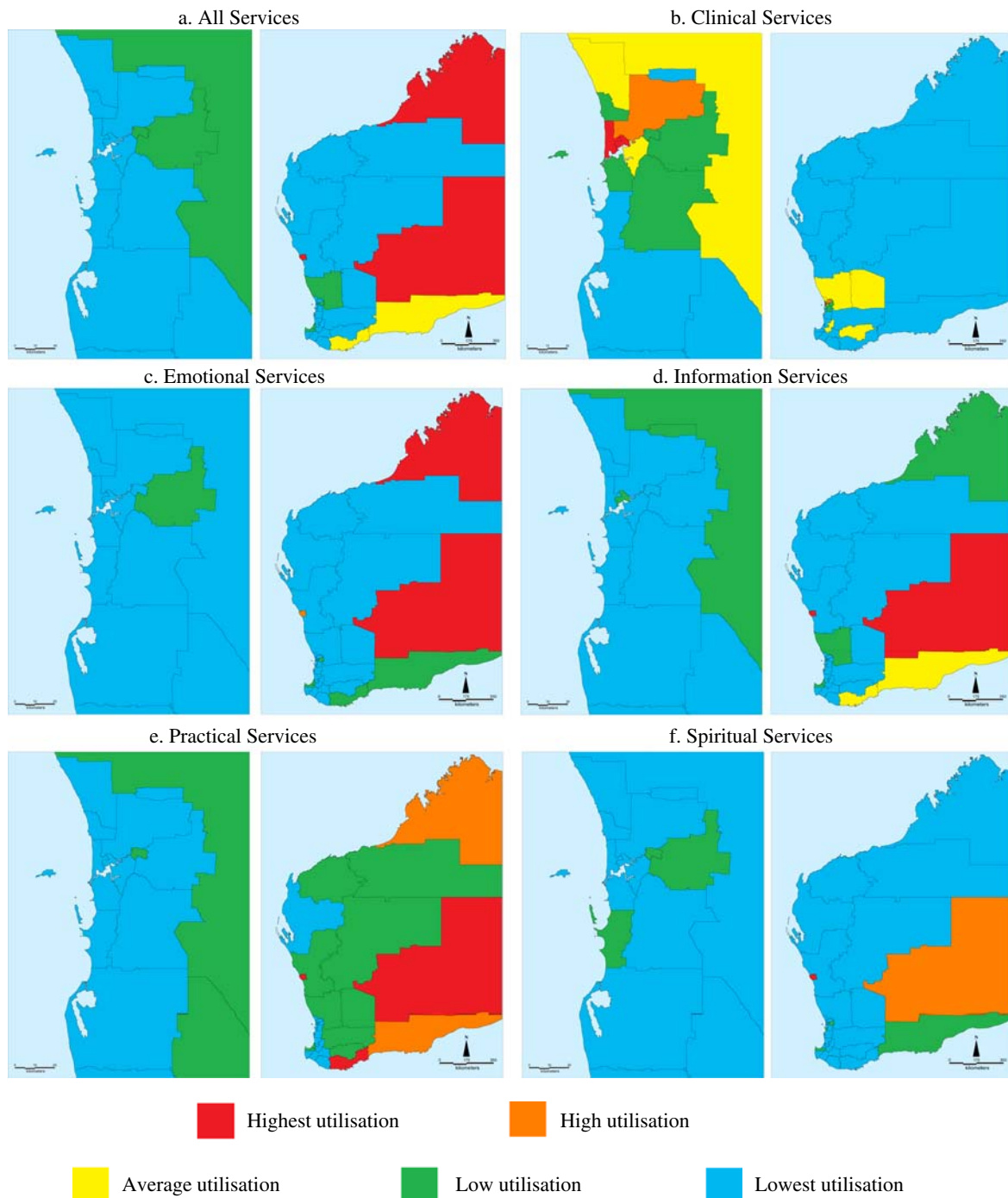
The findings with respect to socio-economic status are particularly interesting, given that the prevalence of cancer generally increases with socio-economic advantage [27]. Nonetheless, it should also be noted that survival rates are impacted upon by socio-economic status which will generally be lower amongst those of lower socio-economic backgrounds in the longer term. Thus, whilst this study has shown that CCWA services are not provided uniformly (horizontal equity) across strata of socio-economic status, the

direction of the inequity is most likely consistent with the goals of the CCWA (vertical equity).

Accessibility, or the lack thereof to mainstream health services, may be the driving force behind many of the utilisation patterns observed when utilisation was measured according to geographic location. Since some of the services provided by the CCWA are specifically targeted at patients from rural and remote areas, a clear link between the aim of these services and the observed increased rate of utilisation found for rural and remote patients can be distinguished. It may also be that the patients in the metropolitan area have alternative support services not available to those in more rural and remote regions, and this is where the CCWA services fill the gap. The relationship between accessibility to services and utilisation is clearly demonstrated with the increased utilisation of all services at a regional CCWA centre for support service provision which is highly utilised by the local residents.

This study suggest that with the notable exception of clinical services, the CCWA is succeeding in providing cancer support services to the most vulnerable and disadvantaged individuals within the state (i.e. in accordance with the principles of vertical equity) with respect to socio-economic status and geographic accessibility. However, the results for age infer that there may be some underlying accessibility





**Fig. 2** Relative service utilisation for all services and by service type across health district for patients diagnosed with cancer

issues for the aged population which may be worthwhile investigating further.

**Strengths and limitations**

Caution must be exercised when interpreting these results since the cancer helpline data did not include age information and therefore was excluded from the analysis.

However, it would not be unreasonable to assume that the cancer helpline service would follow similar patterns of utilisation as the other services. In addition, when utilisation within service types were evaluated, patterns of utilisation remained reasonably consistent within each service constituency. Age was not accounted for when evaluating utilisation across socio-economic status, which is also a limitation of this study. For example, the present results

cannot distinguish between utilisation by different age groups within each socio-economic stratum; however, given the scope and time frame of this study, the methodology employed was adequate for the aim. This study also lacked the capacity to determine the staging of the cancer, or if the cancer was active or if the patient was in remission. These issues were beyond the scope of the study.

The major strength of this study stems from the use of administrative data which is collected under normal circumstances. The routine nature of this data collection limits the impact of the data collection itself. Furthermore, the cancer prevalent population data was sourced from the WA Cancer Registry, an administrative data set managed and maintained by the WA Department of Health to monitor cancer cases to inform researchers and service providers.

## Conclusion

The need for support services for elderly cancer patients both post-surgical and post-active treatment phase cannot be understated [28] in order to reassure patients and families and to clarify care needs during these phases [28]. With survival rates post-treatment improving and the functional age of those with chronic illness decreasing, the need for greater targeting of services for the over 65 years age group of cancer patients and survivors is all the more relevant [28]. In addition, the continuing struggle to provide ongoing clinical cancer support services to rural and remote areas of Australia is evident from this study.

Our use of readily available cancer registry data and the normally collected administrative records of CCWA services have provided useful information on whether the CCWA are achieving their stated goals regarding equitable provision of services across WA.

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**Conflicts of Interest** None

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