

The value of volunteers in State Emergency Services

Gaminda Ganewatta & John Handmer present their research on the value of SES volunteers to Australian society.

Abstract

This paper presents estimates of the economic value of volunteers in the State Emergency Services (SES) of NSW, Victoria and South Australia. The value is based on the value of the time provided by volunteers. The estimates are based on a detailed survey conducted on volunteer time allocation, and data on the activities of SES volunteers over several years in NSW, Victoria and South Australia. We used two methods for valuing time: the "global substitution" method where an average wage rate is used to value all activities, and the "task specific substitution" method where each task is valued at its market wage rate. The value of volunteer time given for community services, operational response, training and unit management averaged around \$ 52, 19 and 12 million a year in NSW, Victoria and South Australia respectively. We also extended the analysis by counting the standby time of volunteers to present complete picture of the value of time volunteers contributed to the State Emergency Services. The addition of standby time greatly increases the value of the time provided.

Introduction

State Emergency Services (SES) are organisations dedicated to assisting communities prepare for and respond to unexpected events and play a vital role in confronting the effects of natural and human made emergencies in all states and territories. In the absence of institutions like the SES, governments would need to provide similar services either by increasing the size of existing non-volunteer emergency services, establishing full-time specialised career institutions or by purchasing the services commercially. Such actions would require considerable resources and highlight the value of SES volunteers to communities. This paper examines the value of SES volunteers to Australian society by valuing the time they make available.

Volunteers make direct economic contributions to society in a number of ways, and these contributions can be expensive and difficult to replace. Assigning economic value to volunteer activities gives an opportunity to make valid comparisons with other fee-for-service or market activities. An economic value for the contribution of volunteers can justify the cost of training and equipping volunteer organisations (Rhenborg and DeSpain 2003), and may help boost the recognition of the contribution of volunteers to society thereby enhancing the idea of volunteerism (Goulbourne and Embuldeniya 2002, Smith and Ellis 2003). An economic value may also be useful in public relations, in funding bids and in contract negotiations. Despite the benefits of valuing volunteer time, there are also pitfalls associated with the process. Valuing volunteer time fails to include many of the benefits of volunteering such as the contingent capacity that fire and emergency service volunteers bring to their communities, and the formation of community bonds, and empathy between volunteers and those who received volunteer service (Kam, 1982 & 1983).

We present the economic value of volunteer time for the State Emergency Services of NSW, Victoria and South Australia using two approaches to valuing. The analysis captures the time provided by volunteers for response and recovery as well as prevention and preparation for emergencies using different sources of information. The paper is organised as follows. First, valuing of volunteer time is discussed and details of the methodology used in the study are presented. Then the results of the analysis are presented in several steps to show the value of the time volunteers make available.

The value of volunteers study

The work reported here is drawn from a report prepared for ACSES (Australian Council of State/Territory Emergency Services), AFAC (Australian Council of Fire and Emergency Services Authorities) and the Bushfire CRC (Cooperative Research Centre) (Ganewatta, Bennett and Handmer, 2008), which in turn drew on earlier work reported in Percovich and Handmer (2004) undertaken for EMA and the NSW and Victorian SESs.

Research methods were developed and refined in consultation with SES Headquarters and regional staff in NSW and Victoria, and then with ACSES. We also examined approaches used by two fire agencies in similar work. Our project ran over several years in two phases. In the first phase, detailed mail surveys were sent to all NSW and Victorian SES units for completion over two two-week periods; one period was quiet and one period busy. These provided a snapshot of all activities, including support activities undertaken by the volunteers. About 40% of NSW & Victorian SES units completed the survey. The survey was supplemented by 19 detailed activity diaries completed by participating units, other SES activity data and two case studies. This enabled the development of a preliminary model of time and value. The second phase added long-run SES activity datasets from NSW, Victoria and South Australia, to the model developed in the first phase. A dataset was also available from Tasmania but it has not been included in this paper as the data were collected over a different period. Note that as the project went over several years in distinct phases, some of the dollar values for wages are for earlier years. The result is that final values are conservative and would increase if all values were updated.

Measuring the economic value of volunteering

In the literature, there are two main approaches used to value the work of volunteers. The “output approach” to valuing volunteer work is based on the imputation of market prices to the goods and services produced by volunteer activities. The “input approach” of valuing volunteer work measures the value of the time volunteers make available for SES activities. The basic attributes of the approaches are reviewed here very briefly.

Output Approach

The output method is conceptually based on the approach used to value production of marketable goods and services (de Vaus et al. 2003; Gray and Stanton, 2003). This method relies on the availability of a market value for a comparable service. Usually this requires for comparison the existence of a profit-driven company that sells (and hence provides a market value for) a similar service to that of volunteers.

The use of the output method for valuing certain volunteer activities is problematic as there are often no organisations that offer the same service for a fee (Ziemec, 2002). The use of market prices for outputs may also be challenging for a volunteer organisation that performs a wide variety of tasks due to a lack of data on the specifics of the various activities. Volunteers use equipment provided from public funds. The estimates from an output approach to value volunteer time need to be corrected for the value of publicly

funded inputs. Collection of data on the outputs produced by volunteers, and costs of other inputs used, requires both high level capabilities in information management and the time to undertake a task that for many volunteer groups will be a low priority. Percovich and Handmer (2004) found that data collected by SESs covered response activities reasonably well, but that generally other activities were not documented. There are professional organisations that perform some of the tasks of the SES (for example, metropolitan fire brigades perform road crash rescue), but this is in a metropolitan rather than rural and remote context. However, in Australia at least, there are no commercial organisations carrying out the broad suite of work undertaken by the state emergency services. Thus the output method is of limited use in valuing SES volunteers. Nevertheless, the economic value of volunteer outputs may be of use in justifying the resources provided for SES activities.

Input Approaches

Input approaches are based on an imputation of value to time worked by volunteers. There are three methods to achieving a value for volunteer time under the input approach as outlined below.

Opportunity cost method: this method is based on the value of activities foregone by individual volunteers when donating time. Individuals from different socioeconomic backgrounds volunteer for emergency services. Thus, each volunteer has a specific opportunity cost for time at emergency service work even when engaged in similar tasks. Accurate calculations would need detail on each individuals’ opportunity costs, or estimates based on individual socioeconomic circumstances and activities forgone at each volunteering exercise. This would potentially yield a wide range of estimates depending on the skills of and opportunities foregone by individual volunteers, as well as the socioeconomic circumstances of each volunteer. Thus it is impractical to use the opportunity cost approach for valuing volunteer contributions in large organisations like the SESs that have a very diverse group of volunteers. The Australian Bureau of Statistics (ABS) has argued that the opportunity cost should not be based on the forgone wage but on the value individuals place on leisure since individuals may contribute for volunteer activities only in their leisure time (ABS 2002). However, this proposition does not hold with emergency services as volunteers often respond during work hours and when they would normally be asleep.

Global substitution method: here a ‘global’ hourly rate is attributed to all volunteer activities by using the cost of hiring a paid (non-specialised) worker to complete a volunteer’s tasks. This method is widely used because of its simplicity and typically employs an average wage figure. As a result estimates of value may be low in the absence of allowance for specialised skills and activities. The method needs estimates of the total time provided by volunteers.

Specialised substitution method: this approach uses the relevant wage of a specialist with appropriate skills for the task. It is important to find an appropriate wage-rate for both this and the “global” methods. Both Dalsimer (1989) and Goulbourne and Embuldnnya (2002) particularly emphasised the need to avoid minimum wages for the valuing exercise, as this is likely to result in substantial underestimates of the value of volunteers’ contributions. The approach requires detailed data on how volunteers spend their time so specialised tasks can be identified and valued.

In summary: the global substitution approach is convenient in practice but provides lower bound estimates compared to specialised substitution approaches that generate a more complete picture, albeit with much more effort for the analysis and more detailed data requirements. The global substitution and specialised substitution approaches trade accuracy for practicality and therefore the choice should be to match the objective of the valuing exercise. Accuracy may be desirable for valuing volunteer contributions, but achieving this accuracy may not be practicable within the resources available, particularly for larger volunteer organisations.

The approach used in this study

Researchers are in favour of non-opportunity cost based input approaches for empirical work on valuing volunteer time. As mentioned above and set out in Dalsimer (1989) and Goulbourne and Embuldnnya (2002), there are theoretical and practical problems with the opportunity-cost and the input approaches. For empirical studies, input approaches have advantages compared to the more extrapolative output method. Accordingly, we employ two input based approaches to value volunteer time for the present study with the purpose of presenting a comprehensive picture of the value of SES volunteer activities.

Task-specific substitution method: This method is a modification of the specialised substitution method described in the literature. It allows us to achieve a reasonably accurate estimate while avoiding the computational difficulties of using specific wage rates for every volunteer task. Task specific substitution method first identifies a number of different tasks volunteers perform based on the similarities of the work and skills required to perform the job. Then a position description for each task is established and an appropriate wage rate is approximated from paid positions with similar position descriptions for the task. It provides a simplified computational process as fewer wage rates are used in the analysis. For example, time spent on road crash rescue will be valued at a specialist (fire fighter) wage rate while time spent catering will be valued at a different (caterer’s) rate even though these activities may be performed by the same volunteer.

This approach has two advantages over the other input methods discussed above. Firstly it accounts for the diverse range of activities of volunteers, but avoids attempting to attribute job descriptions to all volunteer activity. Secondly, it uses readily available wage-rates and established existing professional position descriptions avoiding the need to classify the diverse activities of individual volunteers into more specific position descriptions. Central to this method is the assumption that volunteers with different professional backgrounds and different paid work could perform a diverse range of activities in the SES. We contend that this assumption is valid for the SES due to the large size of the organisations and the diverse backgrounds of its volunteers. In the approach, it is assumed that volunteers are equally as productive in performing a particular task as those paid to do similar tasks outside the SES.

Global substitution method: this approach is used as second input method in this study with the aim of further simplifying the process of volunteer valuation. The method simply tallies all volunteer hours recorded and multiplies by the average Australian wage. The method provides a lower bound estimate with relatively little effort.

The value of SES volunteers

The use of appropriate wage rates and the capture of the actual time volunteers make available for emergency services are key factors in calculating an estimate of the economic value of volunteer time. Collecting detailed information on volunteer time remains a difficult task in contrast to the conceptual complexity of identifying the appropriate wage rates for assigning value. Thus we present the value of SES volunteer time in several stages capturing the diversity of the commitment volunteers make. In these stages, we combined data provided by the SESs on the time spent by volunteers on operations with survey information from a previous study (Percovich and Handmer, 2004), to generate a comprehensive picture of the actual time volunteers make available. The Percovich and Handmer study surveyed all SES units in NSW and Victoria collecting very detailed information on the time provided by volunteers for SES activities. A follow up study developed the task specific method (Ganewatta, Bennett and Handmer, 2008).

Choice of Wage Rates

The integrity of the task specific substitution method relies on the accurate matching of professional position descriptions and wages to volunteer tasks. In the present study, we follow the approach used in the previous report of the Centre for Risk and Community Safety (Percovich and Handmer 2004) and use the same wage rates selected for each position description using the relevant industrial awards and agreements effective in Victoria in 2004. The wage rates used in the analysis are shown in Table 1. There are differences in wage rates among states and territories. The authors choose wage rates from Victoria to simplify computation and to provide consistency when comparing the value of different tasks. For the global substitution method, the relevant wage rate is the 2004 Australian average hourly rate of just under \$ 24. No allowance has been made for shift or weekend loadings. These would increase the value of volunteer time.

Table 1: Position description and wage rate equivalents of SES volunteer tasks.		
Volunteer Task/ Activity	Position Description	Wage Rate (A\$/hr)
Response / Operations		
Storm	Construction Worker 3	35.05
Flood	Qualified Lead Fire Fighter	35.05
Road Crash rescue	Qualified Lead Fire Fighter (special rates)	38.04
Search and Rescue	Qualified Lead Fire Fighter	35.05
Fire Support	Qualified Lead Fire Fighter	35.05
Other	Qualified Lead Fire Fighter	35.05
Training	Qualified Lead Fire Fighter	35.05
Community Service	Community Development Worker (Class II)	24.30
Unit Management & Associated Activities	Victorian Public Service (Non Executive Band 1)	20.69

Source: The Social Value of Volunteerism in the State Emergency Services, Centre for Risk and Community Safety, RMIT University (2004).

Volunteer Time

SES agencies provided data on the time spent on response activities. Importantly, these data do not cover the time spent on unit management, training, community programs and stand-by arrangements. Alternative approaches are needed to derive estimates of the time volunteers contribute to agencies for these activities and the overall smooth operation of their organisations. In order to do so, we combine the actual data on time given for operational activities (from a ten year period for NSW and Victoria and seven years for South Australia) with results obtained from the survey conducted previously in NSW and Victoria to study SES volunteer time allocation (Percovich and Handmer 2004). This study established the proportion of time volunteers spend on community services, training, unit management and standby arrangements as well as on emergency response. We used these findings to estimate the volunteer time spent on SES unit management and training in NSW and Victoria. We also estimated the time volunteers spent on community education program in Victoria using the same approach. By following this approach, we treated non-response activities as a function of operational time whereby more operational activity is assumed to generate additional training through the year and vice versa. Given the importance of this assumption, we tested the result for sensitivity by using a fixed time allocation for training and unit management generated using average response time from the dataset. The overall result is relatively insensitive to changes in training based on response activity level. This can be attributed to the relatively large proportion of time spend on training and unit management compared to response time. The details of the data sets and their preparation for analysis are contained in the two reports.

We next present the economic value assigned for volunteers' time in the state emergency services of NSW, Victoria and South Australia using the two approaches identified above: the task specific and global substitution approaches. Table 2 gives information on the average value of volunteer time allocated for different activities in the three states.

Table 2: Value of volunteer time for various activities of the State Emergency Service using Task Specific Substitution Method*

Activity	NSW**	Victoria**	South Australia#
Fire Support	1034386	138686	104664
Flood	775319	148924	160043
Other Emergency Services	727084	448726	205143
Road Rescue	358874	503576	337719
Search and Rescue	967388	520543	434865
Storm	4479741	1084562	624821
Community Service	1309602	1584058	547378
Training	35610627	12079208	7929216
Unit Management Activities	7507478	2546554	1671647
Total Value	52,770,499	19,054,838	12,015,498

* valued at 2004 wage rate
 ** average from 1994/95 to 2004/05
 # average for 2000 - 06

The estimates shown in Table 2 indicate that the time SES volunteers provide is quite significant in terms of money value. Total value of volunteer time given is worth \$ 52, 19 and 12 million in 2004 dollars to SESs in NSW, Victoria and South Australia respectively. It shows that volunteers spend most of their time on training programs followed by operational and unit management activities. They also give significant time for community services as well. In terms of response, SES volunteers in NSW contributed most for storm related emergency operations followed by bushfire related operations in a typical year. In Victoria, the value of volunteer time given for storm operations is the highest among operational activities although road crash rescue is also important. Volunteers in South Australia also contributed their time primarily for storm related activities followed by search and rescue operations.

Table 3 reports the value of volunteer time for NSW, Victoria and South Australia Using the global substitution method. This method results in a lower value as expected given that the wage rate used is significantly lower for many of the tasks performed, and for most of the hours contributed, by volunteers.

Table 3: Value of volunteer time for SES activities using the Global Substitution Method*

	NSW**	Victoria**	South Australia#
Value of Volunteer Time	41,982,368	14,240,518	9,347,975

* valued at 2004 wage rate
 ** average from 1994/95 to 2004/05
 # average for 2000 - 2006

Stand-by time

The ability of State Emergency Services to respond to an emergency is largely related to the rapid availability of volunteers – in other words volunteers on stand-by. Some functions, such as road crash rescue, would not be possible without stand-by arrangements. Nevertheless, neither the global substitution nor task specific methods take account of stand-by time, and volunteer time valued so far does not include any allowance for stand-by arrangements. Since no specific data were collected by SESs concerning the amount of time spent on stand-by by volunteers, we established the volunteers stand by time for our valuation exercise using the findings of the Percovich and Handmer (2004) study. The estimate of stand by time is based on the average stand by time per volunteer from the survey and the number of active volunteers of SES in the year that survey was implemented. Percovich and Handmer (2004) showed that 61 per cent of active volunteers were involved in stand-by arrangements. It was estimated (in consultation with the NSW and Victorian SESs) that 61 percent of all active SES volunteers were on stand-by at all times outside hours of normal employment and the four hours a week the survey showed the average SES volunteer spent on SES activities. Under the assumption that the empirical data recorded in the surveys were representative of all SES units throughout the year, 61 percent of active volunteers spend 120 hours a week on stand-by arrangement.

Some emergency services practitioners contend that ‘stand-by’ time should be valued through comparison with emergency service professionals’ wages; that is, volunteer ‘stand-by’ time is considered equivalent to, for example, having fire fighters present at a fire station in readiness for an emergency, and hence should be valued at the wage-rate of fire fighters. This valuing method was rejected as it appeared to overvalue ‘stand-by’ time, as there is a clear distinction between opportunity costs incurred on stand-by time spent at a place of work (such as a fire station) and stand-by time carried out at a location of the volunteer’s choosing.

In a report completed by management consulting firm KPMG, 'on-call' time of professional paramedics was valued at \$ 1.68 per hour based on an 'on-call' allowance made by the Tasmanian Ambulance Service (KPMG, 2001). This method is in keeping with the substitution of market wage rates with volunteer tasks, and hence is favoured in this report. This rate of pay was directly comparable to emergency services work carried out by SES volunteers and we used \$ 1.73 per hour after being adjusted for changes in wages. Thus, the pecuniary contribution of each volunteer on stand-by was \$ 207.60 per week, or \$ 10,795.20 per year in 2004.

Table 4: Value of volunteer time for SES including stand-by arrangement – NSW and Victoria* (\$)

Activity	NSW	Victoria
Community Service	1,309,602 (2%)	1,584,057 (4%)
Response & Recovery	8,342,791 (10%)	2,845,017 (7%)
Time Available for Response (Stand-by time)	33,266,663 (39%)	21,969,548 (54%)
Training	35,610,627 (40%)	12,079,208 (29%)
Unit Mgt. & Other Activities	7,507,478 (9%)	2,546,554 (6%)
Total	86,037,161	41,024,384

* valued at 2004 wage rate

In 2004, there were 5410 and 2710 active volunteers in State Emergency Services of NSW and Victoria (Percovich and Handmer, 2004) – based on advice from the respective SESs. Combining the value of standby time for the 61 percent of volunteers involved with the ten year average value of active volunteer time presented in Table 2, gives the total value of the time volunteers made available to SESs in NSW and Victoria (Table 4). We did not extend this analysis to South Australia as we do not have the necessary information on volunteer membership. The volunteer time from stand-by arrangements constitutes the largest proportion of volunteer time of the total time. As a result of the large time commitment of volunteers for stand-by arrangement, the economic value of the time provided increases markedly even though only a nominal value is used per hour of stand-by. When stand-by time is included, the value of the time provided by SES volunteers in NSW increases by about 65 per cent while the change in Victoria is more than 100 per cent. Table 4 shows that the total time volunteers made available for the NSW and Victorian SESs is worth more than \$86 million a year and more than \$ 41 million a year respectively.

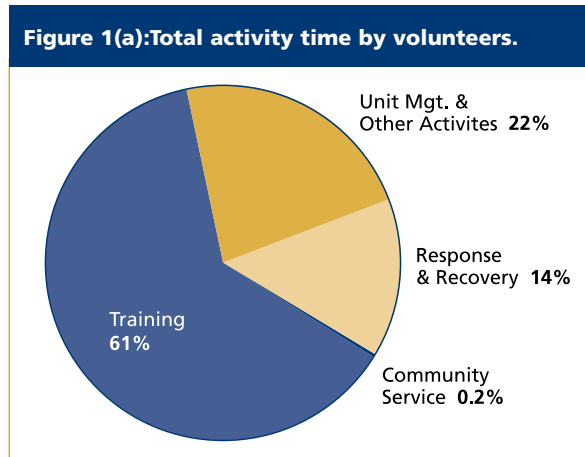
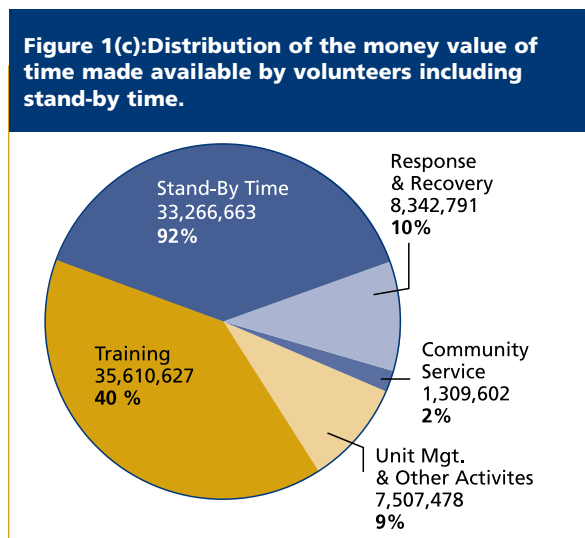
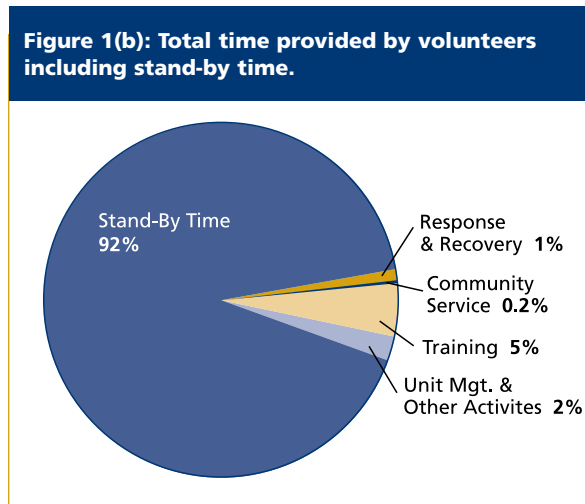


Figure 1 illustrates the allocation of time and money value for SES volunteers in the state of NSW. Figure 1(a) shows the time allocation of all SES activities including training and other associated SES tasks demonstrating that training consumes most the time actually spent by SES volunteers. Figure 1(b) adds stand-by time, while Figure 1(c) shows the value of the time, and shows the overwhelming importance of stand-by both in terms of time made available as well as the value of volunteers.



Concluding Remarks

This report presents estimates of the economic value of volunteer activities of the State Emergency Services to communities in NSW, Victoria and South Australia. In the absence of institutions like the SES that sources its human resources through volunteers, government needs to provide equivalent services through paid staff or private contractors – both approaches require significant resources. This raised the issue of estimating the value of the SES volunteers. Assigning economic value to volunteers' activities also gives the opportunity to make valid comparisons with other services. We use two basic approaches "global substitution method" and "task specific substitution method" to estimate the economic value of SES volunteer time for NSW, Victoria and South Australia. In addition, estimates of the value of stand-by time are included. Nevertheless, this work does not look at the indirect or secondary benefits that may arise through volunteerism as explained through social capital theory. This analysis reveals that the time volunteers provided for operational activities and community programs is quite small compared with the time allocated for training and unit administration. More significantly, the stand-by time of SES volunteers is the largest component of the total time spent by volunteers.

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References

Australian Bureau of Statistics (2002) Australian Economic Indicators 2002 National Accounts Special Article - Unpaid work and the Australian Economy, Australian Bureau of Statistics, Canberra.

Dalsimer, J. P. (1989) Volunteers: What are they worth? *Management Accounting*, 70 (11).

Ganewatta, G., Bennett, J. and J. Handmer, (2008) *The value of volunteers in State Emergency Services*. Prepared for ACSES and AFAC.

Goulbourne, M. and Embuldeniya, D. (2002) *Assigning Economic Value to Volunteer Activity: Eight tolls for efficient Program Management*, Canadian Centre for Philanthropy, Toronto.

Karn, G. N. (1982) 'Money Talks: A guide to Establishing the True Dollar Value of Volunteer Time (Part I)', *The Journal of Volunteer Administration*, 1 (2), pp. 1-17.

Karn, G. N. (1983) 'Money Talks: A guide to Establishing the True Dollar Value of Volunteer Time (Part II)', *The Journal of Volunteer Administration*, 1 (3), pp. 1-19.

KPMG. (2007) *Review of Emergency Response Delivery System of Metropolitan Fire Brigades Board*. KPMG Management Consultant Pty Ltd. January 1997.

Percovich, O. and Handmer, J. (2004) *The social value of volunteerism in the state emergency services*. Centre for Risk and Community Safety, EMA and the NSW and Victorian SES. (Prepared with the assistance of Chas Keys of NSW SES and Paul Jerome of VICSES)

Rhenborg, S. J. and DeSpain, M. (2003) *Investing in Volunteerism: Recommendations Emerging From the Study of the Impact of Volunteers in Texas State Agencies*, *The Journal of Volunteer Administration*, 21 (2), pp. 33-38.

Smith, J. D. and Ellis, A. (2003) *Valuing Volunteering*, *The Journal of Volunteer Administration*, 21 (2), pp. 49-52.

De Vaus, D., Gray, M. and D. Stanton, (2003) *Measuring the value of unpaid household, caring and voluntary work of older Australians*. Research paper No 34, Australian Institute of Family Studies.

Ziemek, Susanne (2002) *The Volume and Economic Value of Volunteering in Four Countries of Differing Income Levels, Volume 1: Conceptual Framework and Methodology*, Centre for Development Research, Bonn University, Germany.

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