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Practices in the Evaluation of Potential Kidney Transplant Recipients who are Elderly: A Survey of US Transplant Centers

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Abbreviations:CKD - chronic kidney disease

ESRD - end-stage renal disease

UNOS – United Network of Organ Sharing

ABSTRACT

Limited data exists regarding the evaluation and selection of older candidates for transplantation. To help guide the development of program protocols and help define research questions in this area, we surveyed US transplant centers regarding their current practices in the evaluation of older kidney transplant candidates.

We emailed a 28-question survey to the medical and surgical directors of 190 adult kidney transplant programs in the US.

We received usable responses from 59 programs, a 31.1% response rate. Most (76.3 %) programs do not have absolute age cut-offs for listing patients, but for the 22.0 % of programs that do have cut-offs, the mean age was 79, range 70-90. Nearly one-third (29.2 %) of programs require a minimum life expectancy to list for transplant, reporting a mean of 4.5 years life

expectancy, (range 2-10). Programs vary significantly in evaluating candidates living in a nursing home or with cognitive impairments.

Practices regarding the evaluation of older transplant candidates vary widely between US programs. Further studies are needed on the impact of age and other comorbidities on transplant outcomes, to help guide decisions on which older patients are most appropriate for transplant listing.

INTRODUCTION

As the US population continues to live longer, and the number of older patients listed for kidney transplantation continues to increase (1) (2), decisions about which patients to exclude from listing have become increasingly common. Older recipients generally have more cardiovascular and other co-morbidities, including cognitive and functional impairments. As a result, most (1) (3) although not all (4) studies have shown that older recipients have worse graft and patient outcomes than younger recipients. However, many studies have demonstrated that older recipients have better survival with kidney transplantation than with dialysis (5) (6) (7), although depending on patient selection, this is not always the case (8) Where exactly to draw the line in accepting candidates for transplantation continues to be challenging. While some predictive models as to which older candidates would benefit have been proposed (9) (10), a consensus conference in 2012 on solid organ transplantation in older adults noted how few studies have addressed these issues (11).

Documenting current practices in the evaluation of older candidates is an important step in guiding the development of program protocols and helping define research questions in this area. To this end, we surveyed US transplant centers regarding their current practices in the evaluation of older kidney transplant candidates.

MATERIALS AND METHODS

We designed a 28-question web-based survey to obtain information on practices regarding the evaluation of elderly candidates for kidney transplantation. We purchased from UNOS a list of medical and surgical directors from all 222 kidney transplant programs, and excluded the 30 pediatric-only programs. Because UNOS does not provide e-mail addresses, we searched the internet and called transplant centers to obtain the current e-mail addresses of the

medical or surgical director. We were unable to obtain email addresses for two programs. We then sent to 190 programs an email describing the study along with a secured hyperlink to complete the online survey. The email was sent three times between 5/3/13 and 6/19/13, with only programs who had not responded receiving repeat requests to answer. We asked respondents to provide their UNOS program code, so we could track whether multiple responses were received from a particular program. For the two program that had two respondents, we used the medical director's responses in the statistical analyses. We used the RedCap survey manager to send emails and manage responses. All answers were kept anonymous. Survey responses were coded and downloaded into Statistical Package for the Social SciencesVersion 19 (IBM Corp., Armonk, NY) for analysis.

Data are expressed as median, mean and SD, or the percentage of centers with specific responses. Survey responses were examined by respondent age (median split), respondent specialty (nephrologist vs. surgeon), program patient volume (median split), and percentage of transplant recipients ≥ 65 year old (median split). Analyses included *t*-tests for continuous variables, the Fisher's exact test for variables with two categories, or a two-tailed chi-squared test for variables with three or more categories. A Bonferroni correction was made for multiple comparisons to determine statistical significance.

RESULTS

Respondent demographics

Out of the 190 programs surveyed, we received responses from 67 (35.3%). Six surveys were returned with no answers, and for two programs, both a nephrologist and surgeon returned surveys, so only the nephrologist's answers were used in our analysis. Therefore, our effective response rate was 59/190 or 31.1%. Respondents were 50.9% nephrologists, 43.4% surgeons and 5.7% other positions. Because the survey questions relate to age, we asked respondents their own age: the median age was 51, mean 51.5 (±8.63) and range 36-71. The number of kidney transplants performed in 2012, not including combined organs, was a median 80, mean 108.5 ± 77.5, range 21-350.

The reported percentage of kidney transplant recipients ≥ 65 years old is shown in figure 1. The median percentage of recipients ≥ 65 years old was 20%, mean 23 ± 11.4 %, with a very

wide range of older recipients, 3-50% of transplants. The reported percentage of *waitlisted* patients ≥ 65 years old was median 25%, mean 23.9 ± 9.8 %, range 7.5-50%. The slightly higher proportion of patients ≥ 65 years old on the waitlist compared to those receiving transplants likely reflects the lower likelihood of transplantation for older patients. All UNOS regions were represented among respondents, with % of total responses (n=54) ranging from 5.6% from region 3 to 16.7% from region 2.

Practices regarding listing of older patients

When asked about the transplant program's upper age cut-off for listing a patient for kidney transplantation (n=59), 76.3% (n =45) reported having no cut-off and 1.7% (n=1) reported another policy. The 22.0% (n=13) of programs with a specific cut-off reported an upper age limit ranging from 70-90 years old, with a median of 80 and mean 79 ± 5.5 years old. Of the respondents with no overall cut-off for listing, a number of programs reported having age limits for listing patients with specific co-morbidities, the most common being heart disease (figure 2).

We also asked whether programs have a cut-off for listing transplant candidates based on life expectancy without transplant. Of the 59 responders, 50.8% reported no cut-off policy, but for the remaining 49.2%, the years of life expectancy required to list ranged from 2-10, with a mean of 4.5 ± 1.7 and median of 5. In a separate question about listing candidates expected to only benefit from transplantation in terms of quality of life, but not length of life, most (61% of n=58) reported that they would list such candidates, while 25.4% would not.

The next series of questions related to impairments sometimes found in older transplant candidates. When asked about listing candidates who live in a nursing home (figure 3), the most common practice is to exclude them from listing (41.4%), but the second most common response (24.1%) was that nursing home residency is not a factor for acceptance. Other programs would accept candidates based on specific reasons for nursing home residency. Cognitive impairment was not necessarily a reason for exclusion (figure 4), with the most common response being that candidates would be excluded only if cognitive impairment was accompanied by lack of good supports to ensure compliance (72.9%). A minority of programs would use cognitive impairment as a listing exclusion only if the impairment was expected to be progressive or if the impairment was "significant." When asked whether a formal cognitive assessment is part of the routine transplant evaluation, 16.9% of programs reported "always" while 69.5% answered that a

formal assessment is only performed when informal assessments suggests doing so. Only one program (1.7%) reported performing formal assessments based on an age cut-off (75 years old). When programs were asked about accepting candidates with function impairment (figure 5), the answers were similar to those about cognitive impairment, with most programs (61%) excluding candidates only if the candidate also does not have good supports, or the impairment was expected to be progressive (32.2%). The approach to formal functional assessments is similar to that for formal cognitive assessments, with 25.4% of programs always performing a functional assessment as part of the transplant evaluation, and 59.3% doing the functional assessment if informal assessments suggested doing so. Almost all programs have the same psychosocial evaluations of candidates based on age (96.6% of n=58), and have the same upper age policy based on sex (96% of n=57) and race/ethnicity (94.9% of n=59).

To assess the interaction between living donation and listing of older transplant candidates, we asked programs about upper age cut-offs to accept living donors. 83.5% of programs do not have an age cut-off for patients to receive a live donor kidney, but of the 13.8% (n=8) that do have a cut-off, the mean age was 75 ± 8.5, range 60-85. One program (1.7%) reported that the cut-off depends on the donor relation. When asked whether a non-directed live donor would be accepted for an older recipient, 78.6% of 58 respondents said yes, while 8.9% would not accept a non-directed donor above an age cut-off ranging from 60-70, mean 68 ± 4.5.

Waitlist management

Several additional questions were asked regarding wait-list management. Most programs (88.1%, n=52) do not have an upper age cut-off for de-listing a potential kidney transplant recipient who was previously listed. However, 8.5% (n=5) of respondents do report having an age cut-off for delisting, ranging from 75-85, mean 79 ± 4.2. While delisting based on age is even less common than denying the initial listing based on age, the presence of various comorbidities are commonly cited as a reason to de-list older candidates (figure 6). The most common reported frequency of re-evaluation of waitlisted patients (n=58) was yearly (51.8%), with every two years (8.9%) and every six months (7.1%) being much less common practices. A substantial proportion (30.4%) responded with “other policy,” including comments that the reevaluation frequency depends on co-morbidities and distance from the top of the list, such that evaluations would be repeated when candidates approached the top.

When asked whether re-evaluations of waitlisted candidates are more frequent if they are older (n=55), 60.0% of programs said no, while 36.4% responded yes, with an age cut-off ranging from 60-70, mean 65.8 ± 4. Similarly, the frequency of repeat cardiac testing (n=58) usually does not depend on age (65.5%), but 29.3% do perform more frequent testing, using an age cut-off ranging from 50-70, mean 59.2 ± 7.6 years old. When asked "if a high quality kidney from a young deceased donor is available, will you ever skip an older potential recipient who is at the top of the list, to give the kidney to someone who is younger (n=57), most respondents said no (71.9%), but 12.3% said yes, with and age-cut off ranging from 60-70, mean 65 ± 7.1 years old.

In addition to the above descriptive statistics, we analyzed the responses to see if we could detect any patterns of different answers based on 1) respondent age, 2) nephrology or surgical position, 3) size of program, and 4) higher or lower percentage of transplant recipients ≥ 65 years old. We did not detect any statistically significant differences in answers based on any of these four respondent characteristics.

DISCUSSION

In areas of medicine with high quality detailed data to guide decision-making, practices tend to be relatively uniform among different providers. However, in the absence of good data, practices vary significantly. Given the limited data to guide US transplant centers in the evaluation and selection of older candidates in listing for kidney transplantation, it is not surprising for us to find that practices differ greatly between centers. The results of our survey demonstrate a wide range in the percentage of over-65 year olds receiving kidney transplants, from 3 % to 50%. These differences may partly reflect differences in local demographics, but also reflect widely different approaches to accepting these older patients.

In general, programs are hesitant to use absolute chronological cut-offs (76.3 % of programs), but if they decide to do so, they pick a relatively high cut-off (median 80 years old). This approach likely reflects that used in many other areas of medicine, in that "physiological" age is considered more important in predicting outcomes than chronological age. While we do not report any statistical analysis of the respondent's comments explaining their answers, this distinction between physiological and chronological age was the most frequent comment seen. Still others pointed out that they decide whether or not to list candidates on a "case by case

basis," without strict protocols. Relatively few programs report protocols suggesting absolute age cut-offs for listing in the context of specific co-morbidities such as cardiovascular disease (figure 2). This overall approach of not excluding candidates purely on the basis of age is also consistent with the recommendations of recent reviews and guidelines (12).

Almost one-third of US programs may try to get at the distinction between physiological and chronological age by having listing guidelines based on life expectancy without transplant, but the reported life-expectancy cut-off varies from 2 to 10 years. Such an approach may be conceptually reasonable, but estimating life expectancy is challenging in itself. Interestingly, 61 % of respondents said they would transplant patients even if the expected benefit would only be in quality, not length of life.

Only 25.4 % of our respondents report performing functional assessments on all candidates, but most of the other programs will perform such assessments if an informal assessment suggests doing so. Yet, how to use this information continues to vary significantly between programs (figure 5). Similarly, programs have variable ways of using the information that a candidate lives in a nursing home (figure 3) or has cognitive impairment (figure 4).

Some transplant providers have questioned the advisability of using live donors for older recipients. However, we find that the vast majority of US programs would accept a live donor for an older recipient, even if that donor were a non-directed donor. In fact, in the comments section of the survey, many respondents reported that while they would list older candidates, they would often only do so if the candidate had a live donor, presumably because of poor expected recipient outcomes after prolonged listing for a deceased donor.

This study has all the limitations of any emailed survey. There is potential bias in self-reporting practices, although the answers were anonymous and it is hard to imagine any pressure on respondents to provide answers that are in any way "better" than the reality. There is also a potential for respondents' not being representative of all US transplant centers. We did find in the UNOS database the actual number of transplants performed in 2012, based on the respondent's reported 4 digit UNOS code, and calculated a mean number of transplants of 99.5, somewhat lower than the reported mean of 108.5. However, the mean number of transplants performed in non-pediatric programs in the US in 2012 was 77.2 (1), not statistically different from the 99.5 mean of respondent programs (p=0.11). This suggests that, at least based on program size, our respondents were similar to all US programs. We also note that those who

were 65 or over comprised 18.4% of patients transplanted in 2012 (1), not far from the mean 22.9 % of our respondents' reported waitlist. Since we did not survey pediatric programs, it is not surprising that the national data, which includes pediatric programs, reports a somewhat lower percentage of ≥ 65 year old recipients. Detailed information on the percentage of ≥ 65 year old transplants in non-pediatric programs is not available to make a direct comparison to our respondents.

Our findings of variable practice patterns in particular areas, such as the impact of cognitive or functional impairments, highlight some specific areas that may be particularly fruitful for research. For example, the difficulty in estimating physiological age remains, but it may be that formal measurements of frailty (13) will be helpful additions in that assessment. Clearly, further studies are needed regarding the impact of age and comorbidities on kidney transplant outcomes, and on which older patients are most appropriate for transplant listing.

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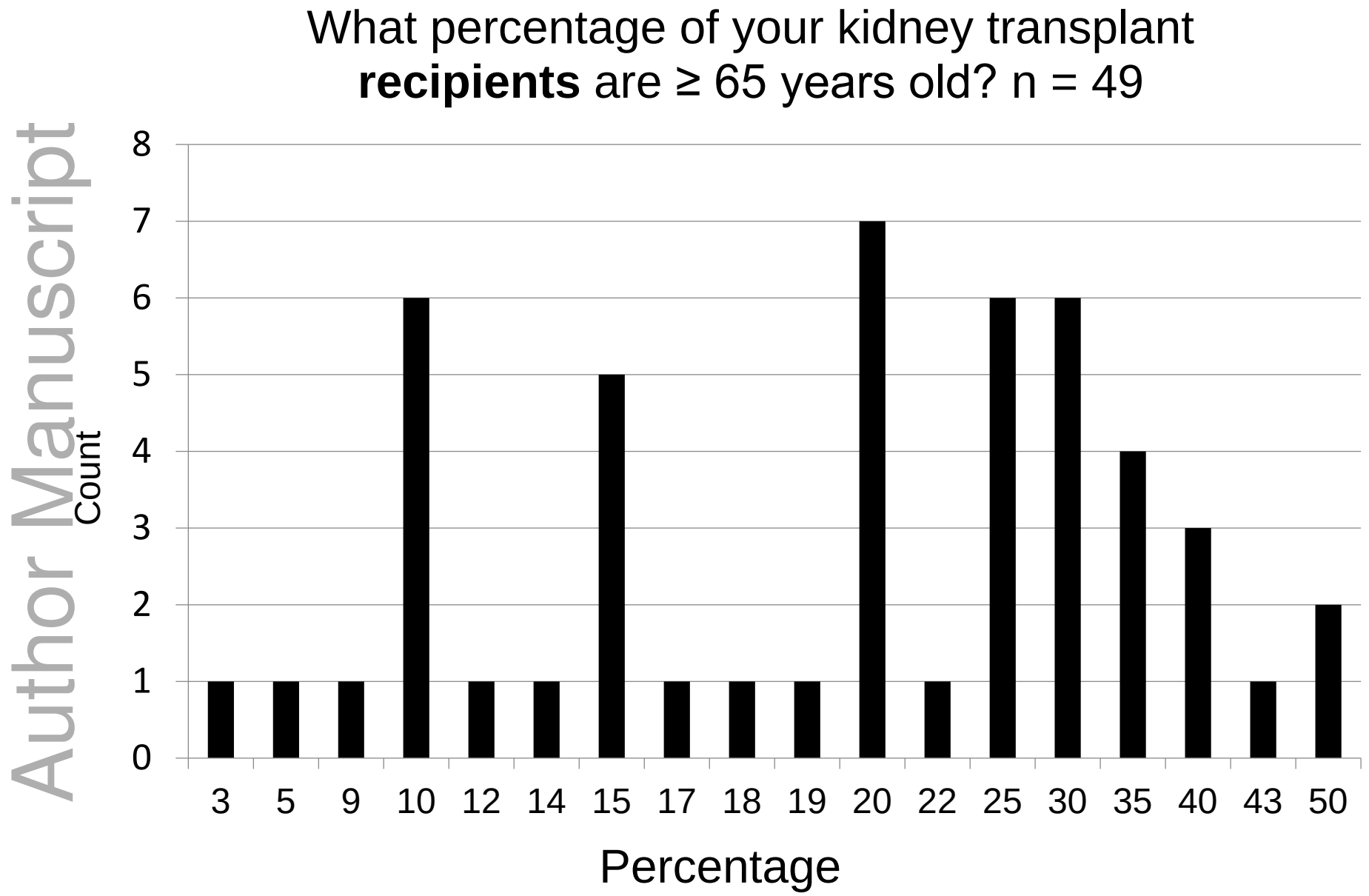

Figure 1

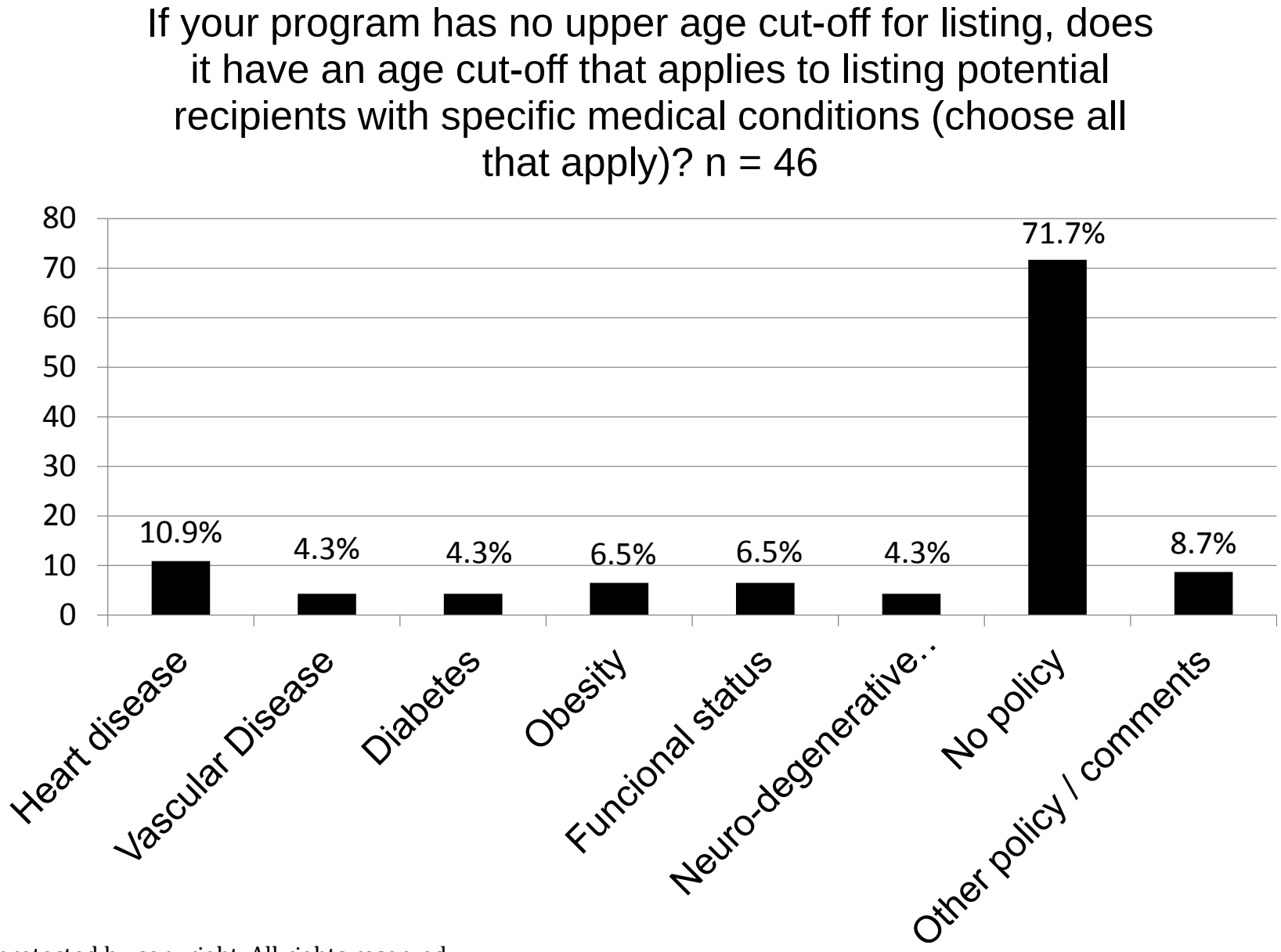

Figure 2

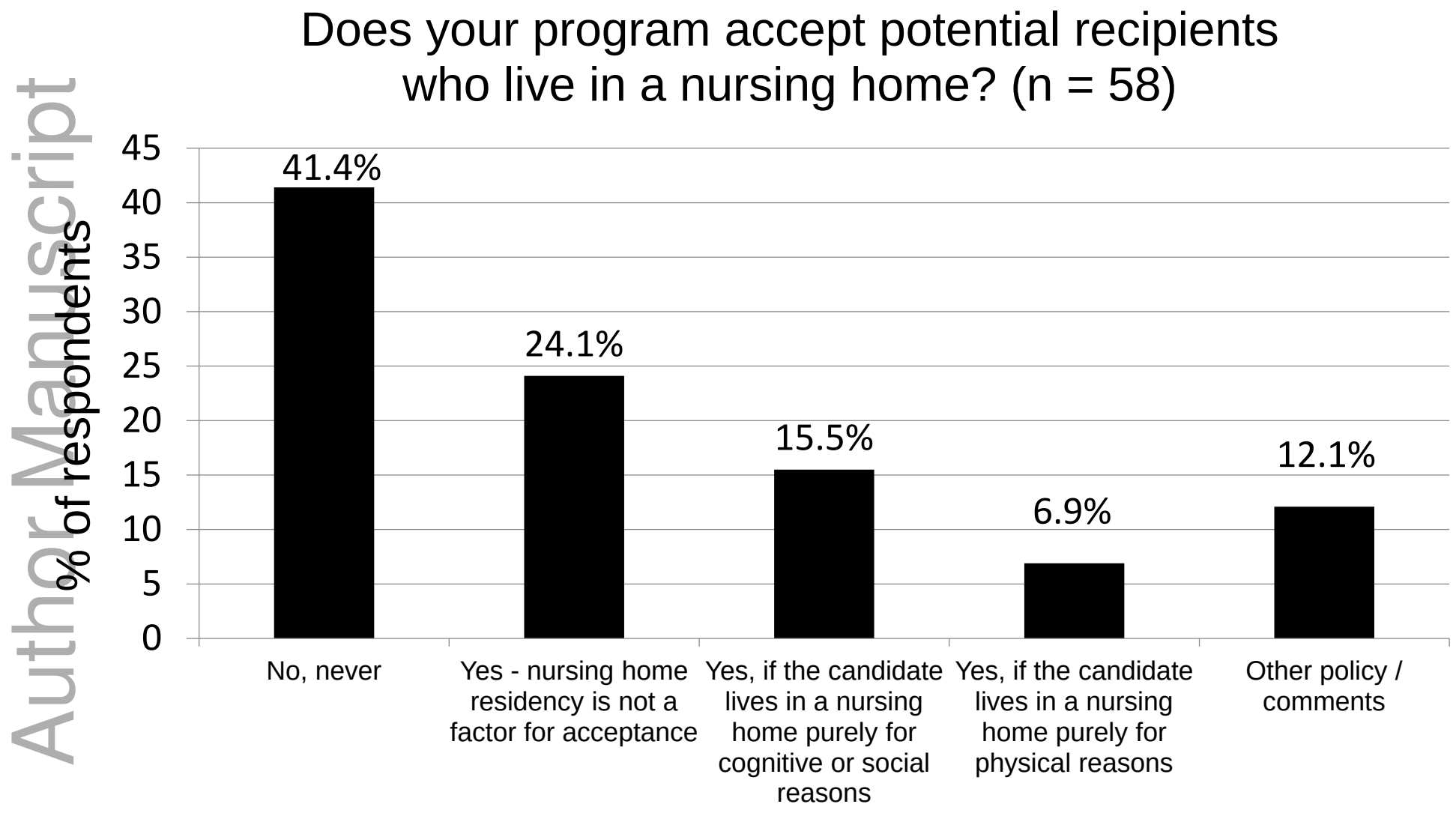

Figure 3

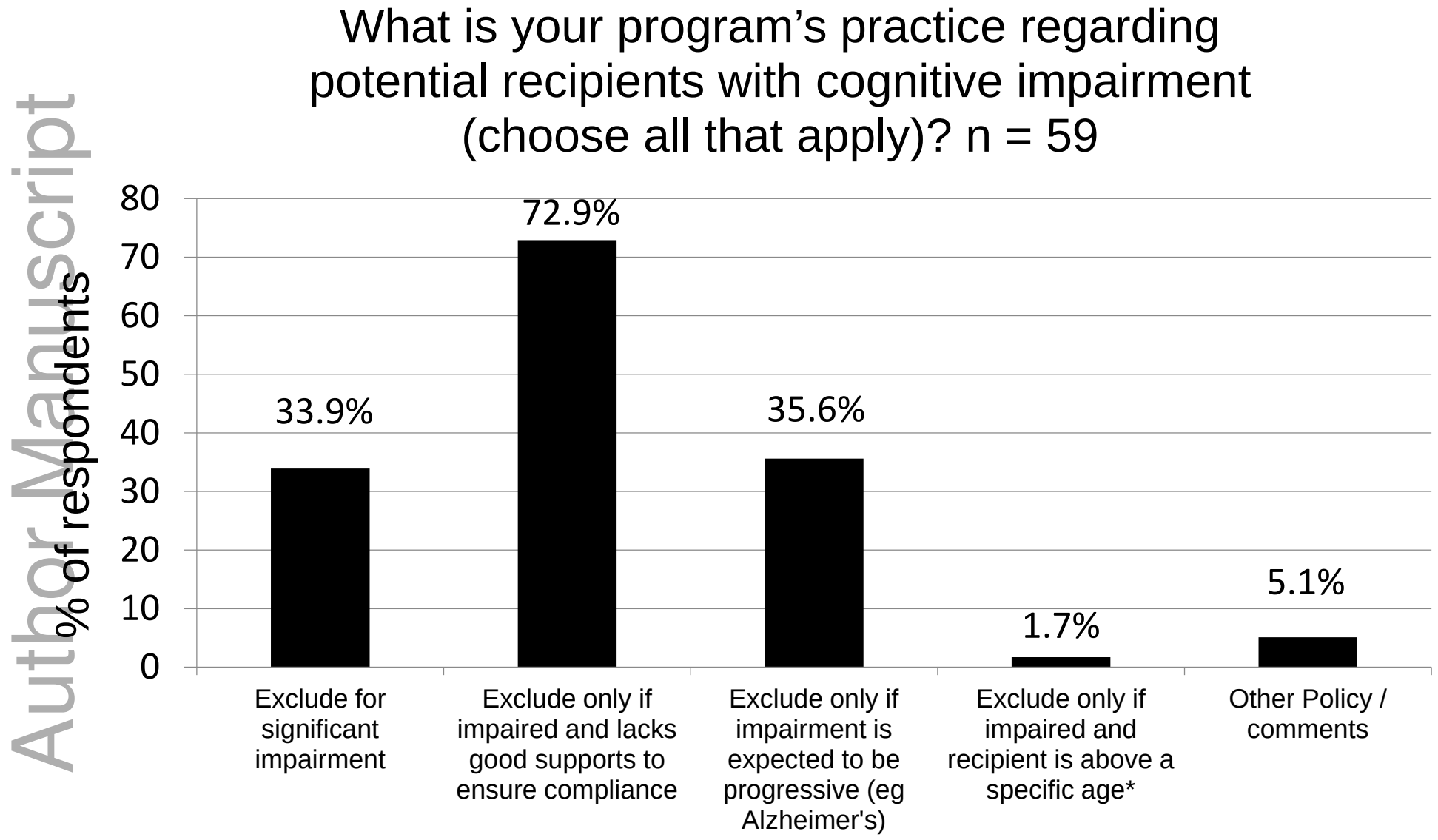

Figure 4

*The one response stated their age cut-off was 70

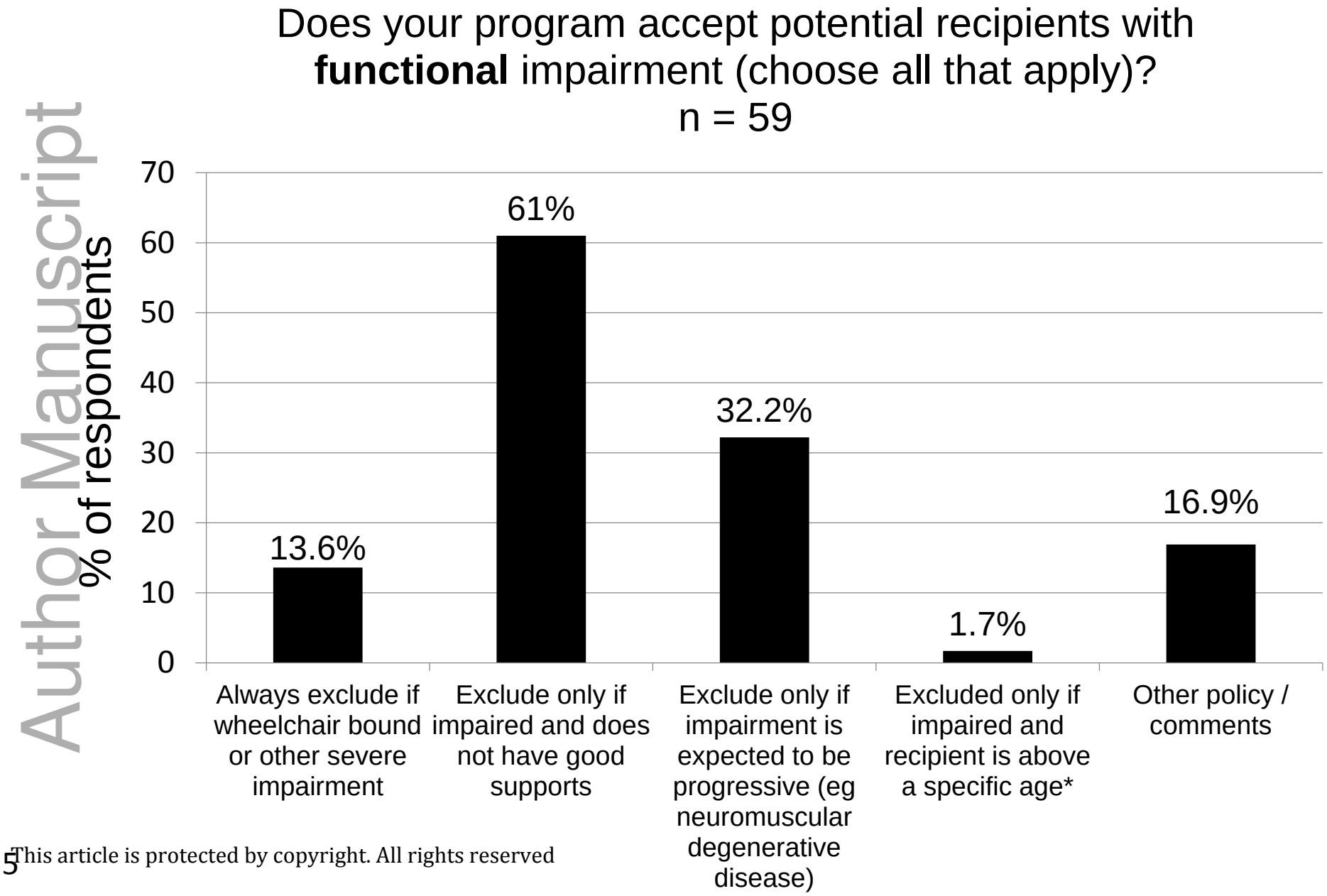

Figure 5

*The one response stated exclusion age was > 65

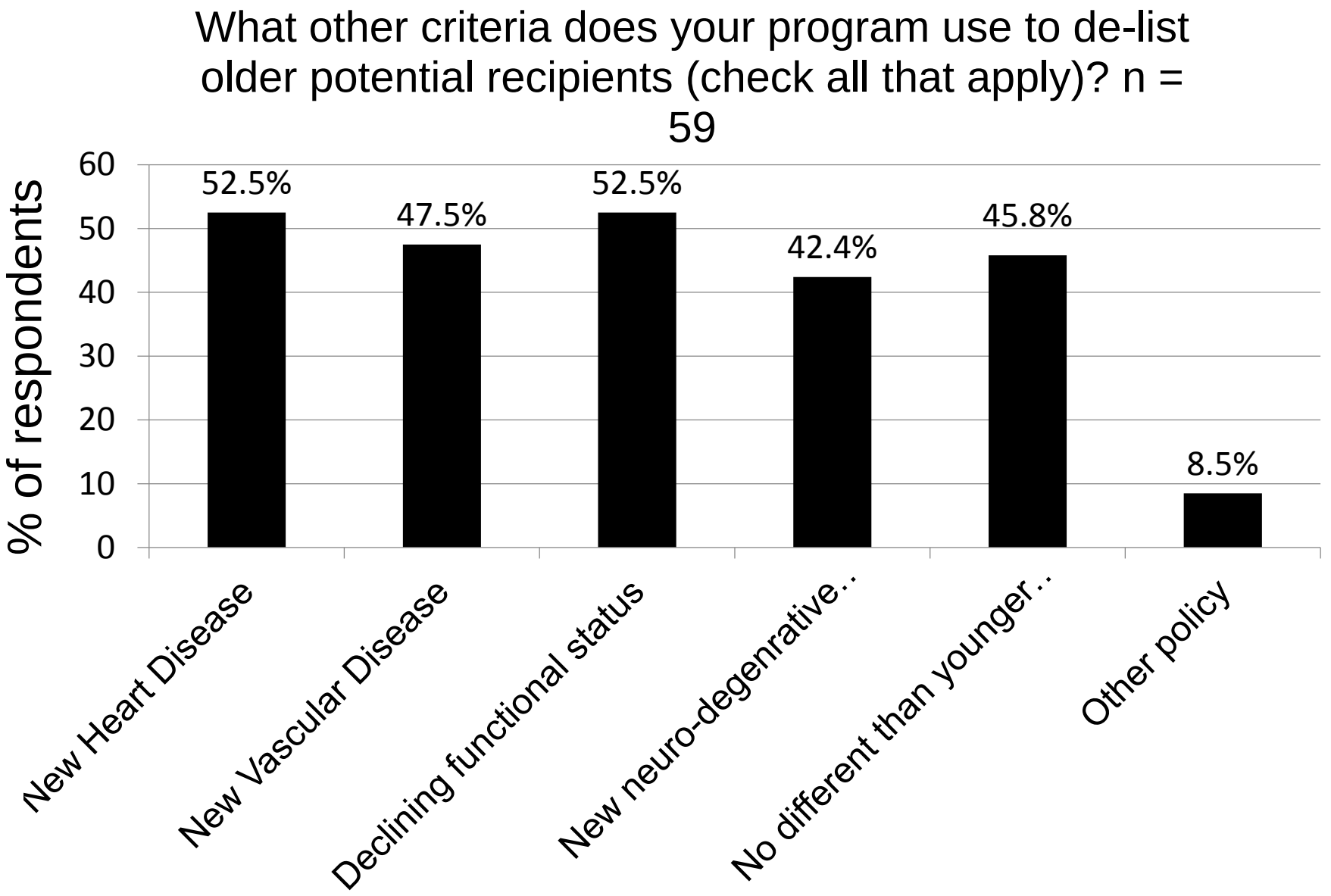

Figure 6