Title: What do Australian dermatologists expect to be paid for store-and-forward teledermoscopy? A preliminary investigation.

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Title

What do Australian dermatologists expect to be paid for store-and-forward teledermoscopy?

Abstract

INTRODUCTION: Determining appropriate remuneration for teledermoscopy service is important because inadequate remuneration can be a barrier to practitioner uptake and participation. This study explores dermatologist remuneration expectations for a single lesion store-and-forward teledermoscopy consultation.

METHODS: 14 dermatologists participated in telephone interviews during May and June 2017. Questions regarding remuneration focused on a clinical scenario involving teledermoscopy of a single lesion suspected to be skin cancer. The initial scenario was an existing patient, with a provisional diagnosis of benign neoplasm from the images, to be followed-up with routine skin checks, taking three minutes to review. Participants indicated their remuneration expectation by selecting from an ascending array of pre-determined remuneration ranges. The question was repeated a further four times with one aspect of the scenario changed each time; consultation length, source (patient or general practitioner), required follow-up, and a new rather than existing patient. Participants were also asked how appropriate they thought teledermoscopy was for the scenario, and whether they would choose to undertake the consultation presented.

RESULTS: Nine dermatologists selected the AU$61-90 or AU$91-120 remuneration ranges for the initial scenario. When given the opportunity to comment on teledermoscopy service provision in Australia respondents reflected that it was a valuable, advanced dermatology service, but they would prefer face-to-face consultation with patients where possible to allow for a full body examination.

DISCUSSION: Dermatologists expect to be remunerated in the range of $61-$120 for a single lesion store-and-forward teledermoscopy consultation when face-to-face examination is not possible.

Key Words

Teledermoscopy, Dermatology, Remuneration, Healthcare Financing, Health Services

Introduction

Store-and-forward teledermoscopy involves the capture of digital images of the skin through a dermoscope which are forwarded to a dermatologist. It is used to provide patients or practitioners with an asynchronous dermatologist consultation that can result in diagnoses and management advice[1, 2]. Alternatively, asynchronous teledermoscopy can be used to triage patients for in-person appointments[2, 3]. Due to its often-pigmented nature, skin cancer is conducive to store-and-forward teledermoscopy. The addition of a dermoscope for collection of clinical images has been shown to improve diagnostic accuracy[1]. Store-and-forward teledermoscopy enables specialists to review high quality images of skin lesions and assess patients for skin cancers[4].

Australia has the highest rate of skin cancer in the world, and with a large geographic area coupled with an uneven of dermatologists means some population groups in need of specialist dermatological care may face difficulties in accessing it. Teledermoscopy has the potential to improve access for the early diagnosis and triage of skin cancer [5, 6].

The health system in Australia operates as fee-for-service; therefore, dermatologists are typically remunerated for consultations by receiving a set Medicare Benefits Scheme (MBS) reimbursement and often a patient co-payment (determined by the specialist or clinic). Although teledermoscopy is currently being used in clinical practice, it is not currently reimbursed under the MBS. Remunerating dermatologists for providing teledermoscopy is important, since inadequate remuneration has been acknowledged as a barrier to practitioner uptake and participation in telehealth[7, 8]. However, determining appropriate remuneration can be complicated as it involves multiple stakeholders, including the dermatologists, the payer (Medicare), and patients.

This research aims to quantify the remuneration expectation of Australian dermatologists for a single lesion store-and-forward teledermoscopy consultation for suspected skin cancer. This topic has not been investigated in Australian or international literature, although there is some research that highlights the important impact of compensation on service viability and uptake[7, 9].

Methods

To quantify remuneration expectations, we used an adapted direct stated-preference methodology which involved interviewing dermatologists and asking them to select remuneration from a range of values for a specified clinical teledermoscopy scenario. Direct stated-preference is also known as a contingent valuation, and while normally used to elicit willingness-to-pay, has been adapted to investigate willingness-to-accept (remuneration in this case)[10]. Contingent valuation methodology is so named because respondents are asked to select a value contingent on the scenario presented to them[11]. Ethics approval was received from The University of Queensland School of Pharmacy Ethics Committee, reference 2016/09, November 21st, 2016.

Interview Questionnaire

The questionnaire was piloted with three dermatologists and four individuals from the general population before recruitment commenced.

The questionnaire contained background questions and research questions about expectations for teledermoscopy remuneration. The background questions covered dermatology experience, teledermatology experience, and primary site of practice (metropolitan, or rural and remote). To provide context for the remuneration answers respondents were also asked to estimate their average hourly billing and provide information on standard initial and review consultation fees at their private clinics. Questions related to earnings and fees were optional.

The research questions consisted of five questions where respondents were presented with a specific clinical scenario (Table 1) and asked to identify their expected remuneration by selecting from a set of ascending pre-determined remuneration ranges. The questionnaire contained two additional questions eliciting Likert scale responses, regarding perceived appropriateness of teledermoscopy for the given scenario, and whether the dermatologist would perform the teledermoscopy consultation. The final question was an open-ended question where respondents could provide any free-text comments about teledermoscopy services in Australia.

The scenarios were designed using teledermoscopy examples from literature and expert opinion and were amended during the pilot process to improve readability and understanding.

Respondents were presented with five scenarios in total; the initial scenario and four variations (Table 1). The initial scenario described an existing patient (of the dermatologist's

practice) with a suspected skin cancer; provisional diagnosis was benign neoplasm based on the images; no follow-up was required beyond routine skin checks, and the teledermoscopy consultation took three minutes. The next four remuneration questions changed one item per scenario whilst keeping all other items constant. The respondent was asked to indicate if they would adjust their answer and if so indicate their new expected remuneration amount on the scale. Again, these variations were derived from literature and expert opinion[12, 13].

When indicating their remuneration expectation respondents were asked to select from an ascending array of pre-determined remuneration brackets including $0, $1-30, $31-60, $61-90, $91-120, $121-150, and more than $150. These values were selected with the current MBS dermatologist attendance fee of $72.75 as an approximate median. Respondents were instructed to select the gross amount they expected to receive for providing the service regardless of payment source (MBS and / or patient). When responding to the remuneration expectation questions respondents were asked to assume that they would perform the review in the scenario (rather than decline it).

Recruitment and data collection

Dermatologists were recruited via an email invitation sent to 102 fellows through the Queensland faculty of the Australasian College of Dermatologists (ACD). In Australia, all dermatologists are members of the ACD, therefore the entire Queensland dermatologist cohort was invited to participate. Snowball sampling was used to recruit additional respondents, which brought in respondents from other Australian states. Potential respondents could indicate their interest or enter their contact information into a dedicated survey webpage or by emailing the primary researcher (CS). The primary researcher contacted each interested respondent and organised a convenient time to complete the telephone interview. Prior to the interview, study information and a copy of the interview questions were emailed to the respondent, and informed consent was obtained. All interviews were conducted by telephone by the primary researcher during May and June 2017.

Data analysis

Data were analysed by comparing the remuneration brackets selected by respondents for each clinical scenario. Collective responses from each scenario were compared to each other to identify any trends in remuneration expectation that may be attributable to clinical scenario variation. Likert scale responses were presented graphically, and free-text comments were

grouped into common themes. Due to the small number of respondents no formal analysis was undertake on free text responses. Responses are reproduced verbatim in Table 2. All reported figures are AU$ representing a 2017 cost year.

Results

Respondent characteristics

Recruitment and interviews occurred between April and July 2017. In this study, 14 dermatologists were interviewed; eight responded to the ACD invitation email (8% response rate from this invitation) and six were recruited through snowballing. Of these, two practiced primarily in non-metropolitan locations (14%), 12 had previous experience either formal or informal with store-and-forward teledermatology (86%), and six routinely used store-and-forward as part of their clinical practice (43%). All the dermatologists worked in private practice, however some also worked in other settings including public hospitals, private hospitals, and for the defence force. Four (28%) had been practicing (designated by registration with the ACD) for less than five years, five (36%) had 5-10 years' experience, and five (36%) had been practicing for more than 10 years.

Responses regarding average hourly billing and standard consultation rates were provided by 13 out of 14 respondents. Some respondents stated that their clinics discounted fees for pensioners and concession card holders (this was not one of the structured questions). Non-discounted consultation fees for an initial consult ranged from $200-265, and review consultations ranged from $99-180.

Remuneration responses

Responses to the initial clinical scenario (existing patient, suspected skin cancer, benign neoplasm diagnosis from images, follow-up with routine skin checks, consultation taking three minutes) remuneration question (Figure 1) ranged from $0 to $91-121, with majority of the responses (N=8, 57%) in the $61-90 and $91-120 categories.

Insert Figure 1 here

When the initial scenario was changed to increase the consult time to 15 minutes, receive the consult from a GP, patient required in-person for follow-up, or consult received from a new patient (Table 1), some of the dermatologists amended their expected remuneration (Figure

2). Remuneration selections did not change much from the initial scenario when the scenario was changed so that the teledermoscopy information came from a general practitioner (Figure 2). When the consultation scenario length was increased to 15 minutes the respondents selected higher remuneration ranges (Figure 2). When asked if they would change their remuneration expectation for a patient who required an in-person examination after the teledermoscopy consultation, seven respondents stated as part of their answer that they would either discount the teledermoscopy consultation or discount the in-person consultation (Figure 2).

Insert Figure 2 here

The last changed scenario was a consultation request from a patient that was unknown to the dermatologist. During piloting it was highlighted that this scenario may be undesirable or unrealistic for some clinicians due to the perceived medico-legal implications of not having an established relationship with the patient and not having the ability to perform a full body skin examination. To account for this, respondents were given the option to say they would not undertake the teledermoscopy consultation in this scenario. As expected, four respondents (29%) stated that they would not undertake the review, citing medico-legal concerns. Of the other ten respondents who said they would undertake the review, some selected higher remuneration ranges to the initial scenario (Figure 2).

Respondents were then asked two Likert scale questions which referred to the initial scenario. The results are shown in Figure 3. They show the respondents belief about the appropriateness of teledermoscopy for the initial clinical scenario, and the respondents decision about whether to perform the specified consultation. Of the 11 (79%) who said they would undertake the consultation most specified that this was because it was an existing patient.

Insert Figure 3 here

Perceptions of teledermoscopy.

When given the opportunity to comment on the provision of teledermoscopy service in Australia respondents reflected that it was a valuable addition to clinical practice, it advanced dermatology service, but given the option they would prefer in-person consultation with

patients if possible. Responses to the open-ended questions are listed in Table 2.

Insert Table 2 here

Discussion

Dermatologists selected remuneration ranges of $0-120 for the initial clinical scenario with the majority (N=9, 64%) expecting remuneration in the ranges of $61-90 or $91-120. Respondents commented that their selected remuneration was relative to their in-person consultations fees in a private practice setting (rather than a public hospital setting), and due to this, needs to not only cover their time, but the business expenses associated with running their clinics. When the teledermoscopy consultation time was increased from 3 minutes to 15 minutes higher remuneration was expected (Figure 2). This aligns with current fee-for-service reimbursement convention in Australia[9].

In the current study, remuneration expectations for teledermoscopy were less than reported in-person consultation fees. This is consistent with established remuneration practices in international contexts. Remuneration for teledermoscopy in the Netherlands was reported as €68 per consultation (paid by private health insurers, compared to €192 for in-person) in 2011[14], and in the United States it was USD$15 in 2003 (paid by the Department of Veterans Affairs, compared to USD$18 for an in-person)[12]. In these studies patients were referred from a primary care provider to the dermatologist for a range of dermatological conditions (not specifically skin cancer) and it was not required that the dermatologist had previously examined the patient being referred.

Currently, there are no Australian cost analyses available for teledermoscopy services[2]. However, there are some comparable services offered either online or via mobile phone applications (apps) that have published prices. FirstCheck (Australia) is an online service which offers consumers a smart-phone attachable dermoscope for a purchase price of $29.95 and an online review of a dermoscopic image of a lesion for $19.95[15]. These prices fall within the ranges that were provided for dermatologists to select from and align with the responses received from all except one respondent who selected $0 for all scenarios. The respondent who selected $0 for each scenario stated in their comments that he/she was uncomfortable charging current patients for digital consultations, and he/she declined to perform a consultation for the unknown patient.

All respondents indicated the valuable contribution that teledermoscopy provided to dermatology care for patients who were unable to attend in-person appointments, a result that has been demonstrated in previous studies[4]. Majority of respondents stated that, given the option they would always prefer seeing patients in person as they are able to complete a full-body skin check. Respondents believed in-person examination reduced indemnity issues related to lesion selection (for teledermoscopy) and limitations of performing a full skin check via telehealth. A number (n=4, 29%) of respondents either currently performed or had previously performed consultancy for a New Zealand teledermatology provider where they performed consultations via telehealth for a patient that they have not previously examined in-person. Their participation in this service may seem at odds with the indemnity concerns identified in the current study but could be explained by the perception that vicarious liability rests with the service provider as opposed to the dermatologist. Others cited potential medico-legal concerns associated with teledermatology including the lack of quality assurance, record keeping, uncertainty regarding indemnity insurance, and the lack of a uniform platform (or technology) for teledermoscopy. In the absence of Australian guidelines for teledermatology, clinicians could refer to the American Telehealth Association guidelines[16] or guidelines from the International Skin Imaging Collaboration (ISIC)[17]. These provide guidelines for image acquisition, storage, retrieval, transmission, and display, and if read in conjunction with the Australian Privacy Principles (Schedule 1 of the Australian Privacy Act)[18] could be translated for use in an Australian setting.

Sample size was a limiting factor in this research. It is possible that the response rate was low due to availability of respondents and the lack of incentive offered. The responses do not necessarily represent the remuneration expectations of Australian dermatologists. Additionally, results may have further generalisability issues given the high level of respondent experience with teledermatology or teledermoscopy. It should also be noted that statistical significance could not be calculated for the differences in remuneration expectation for the five different clinical scenarios due to the low response rate.

Given that the patient in the initial clinical scenario was considered to be an existing patient, the consultation could be considered a review consultation if the lesion being examined had been examined at a previous appointment; however, this was not specified in the scenario. Some dermatologists commented during the interview that their answers were based on this

assumption. Future research should stipulate the type of consultation clearly so that respondents are able answer accurately. The perspective of other stakeholders such as funding agencies (public or provide) and consumer's willingness-to-pay are necessary for a broader perspective of the remuneration and overall economic impact for a medical service such as teledermoscopy. Ultimately, any public funding (e.g. Medicare) will be decided by virtue of a Medical Services Advisory Committee (MSAC) decision on an application. Application can be made by any medical profession, medical industry and others with an interest in seeking Australian government funding for a new medical service. Store-and-forward teledermoscopy has been put forward for funding previously, with an unsuccessful outcome[19, 20].

The data collected from these interviews provide a preliminary insight into the specialist remuneration expectations for providing teledermoscopy services in Australia. As has been highlighted in other publications, remuneration is an important factor for ensuring telehealth services are provided sustainably and equitably[7,9]. In Australia dermatologists expect to be remunerated in the range of $61-$120 for a single lesion store-and-forward teledermoscopy consultation when an in-person examination is not possible. Overall, Australian dermatologists believe that teledermoscopy is an acceptable mode of care for patients who are unable to attend in-person consultations. However, they would prefer an in-person consultation which gives them the option to conduct a full-body examination when necessary.

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Tables

Table 1. Clinical scenario variations

Item	Scenario 1: Initial	Scenario 2: consultation time 15 minutes	Scenario 3: GP referral	Scenario 4: in-person follow-up appointment required	Scenario 5: Unknown patient
Reason for referral (Provisional diagnosis)	Suspected skin cancer (Benign neoplasm)				
Time taken to review	3 minutes	**15 minutes**			
Teledermoscopy information received from	A patient who is known to you (i.e. you have examined or treated them previously)		**A general practitioner (GP)**		**New patient with no existing relationship to you.**
Required follow-up	No action required, full skin check as planned (or review sooner if changes/ concerns)			**In person consultation required because a diagnosis could not be determined from the teledermoscopy images**	

Table 1. Respondent quotes from open-ended question

“It is an absolute must for rural areas."
"It is already happening."
“I think it's appropriate, just not for me - I have enough work in my private practice."
“Helpful for existing patients where you have a pre-existing understanding of their skin. Good for patients or those unable to travel to the clinic easily (overseas or rural).”
“[Teledermoscopy] services don't yet have a high enough quality standard... [it] requires a nationally standardised platform.”
"[Teledermoscopy] Has revolutionised dermatology in Australia, a significant advance for dermatology,”
"I would continue to provide service regardless of funding, but would prefer to be paid."
“There are medico-legal issues with encryption/privacy principles.”

Figures

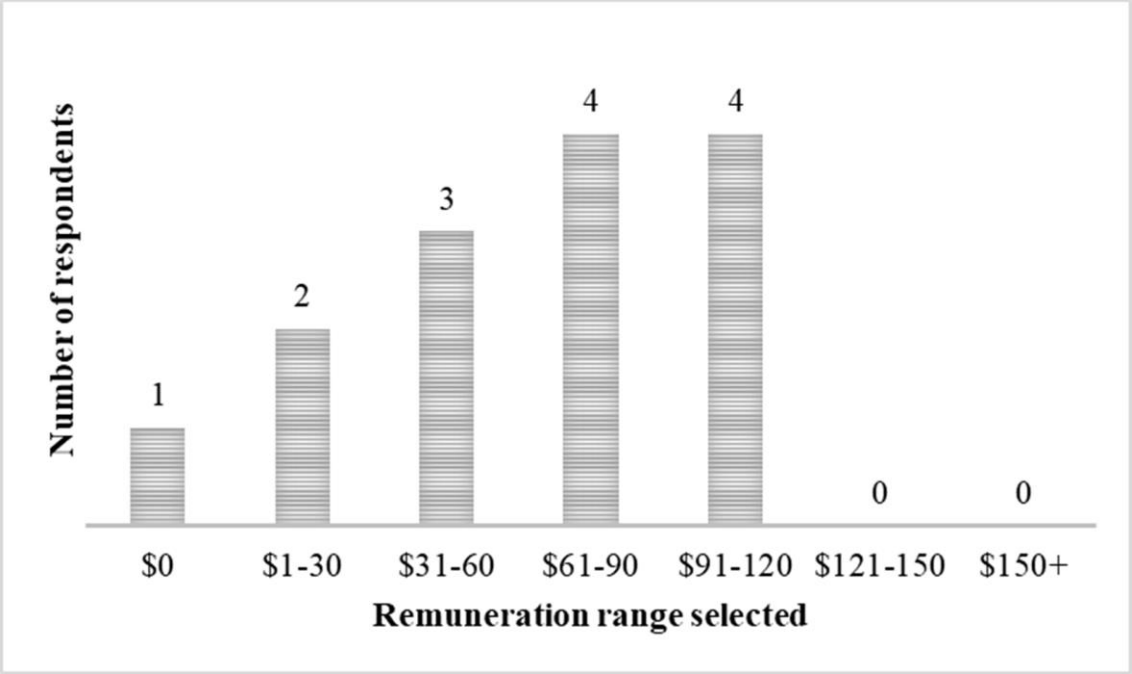


Figure 1. Initial scenario expected remuneration

Figure 1 shows the expected remuneration selected by respondents for the initial scenario.

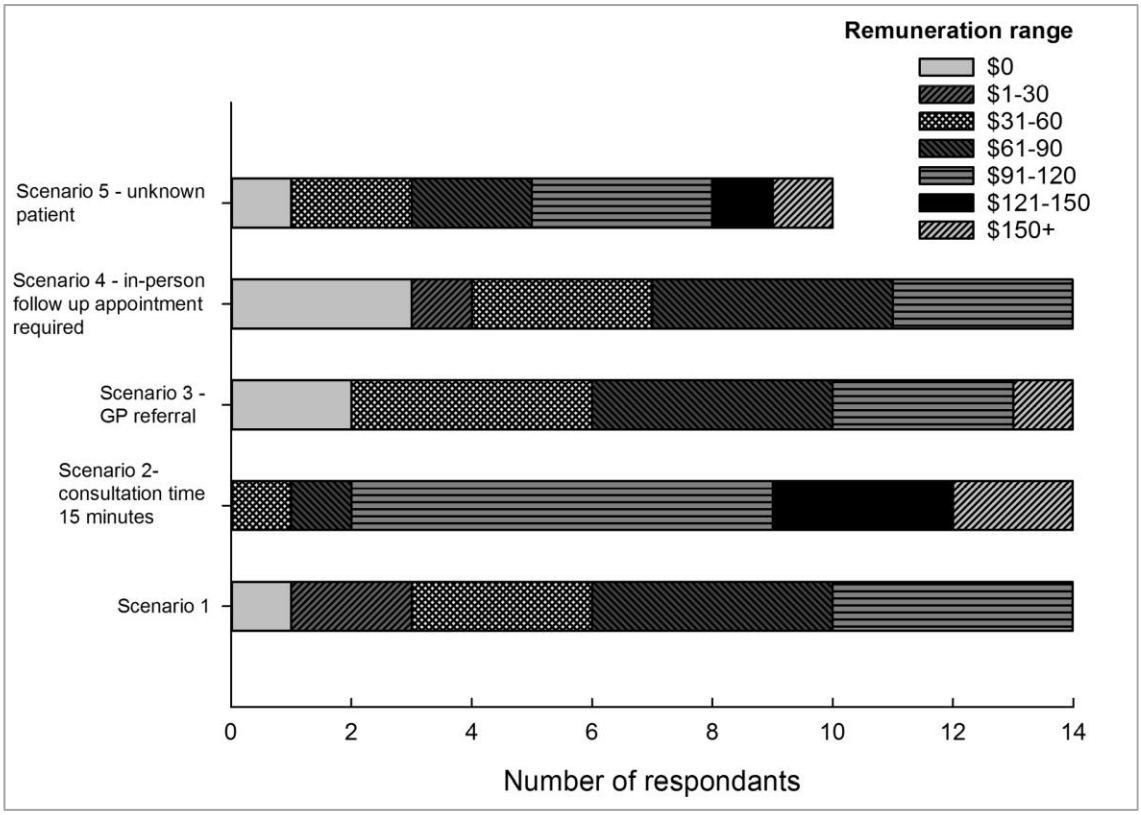


Figure 2. Scenario remuneration expectation variation

Figure 2 shows the expected remuneration selected by respondents for all 5 scenarios.

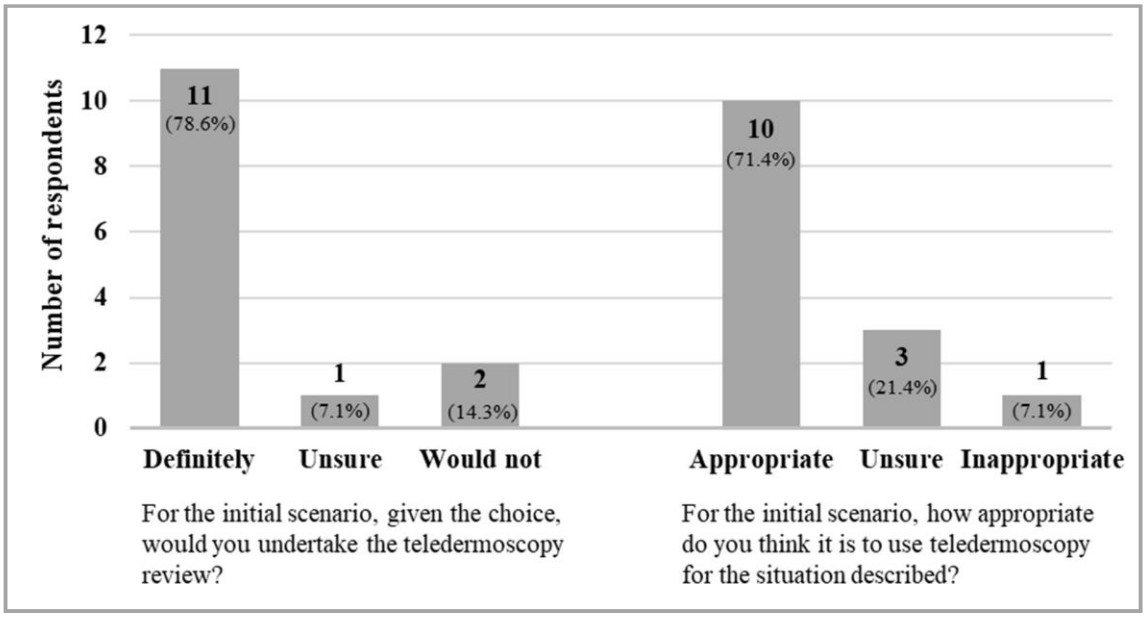
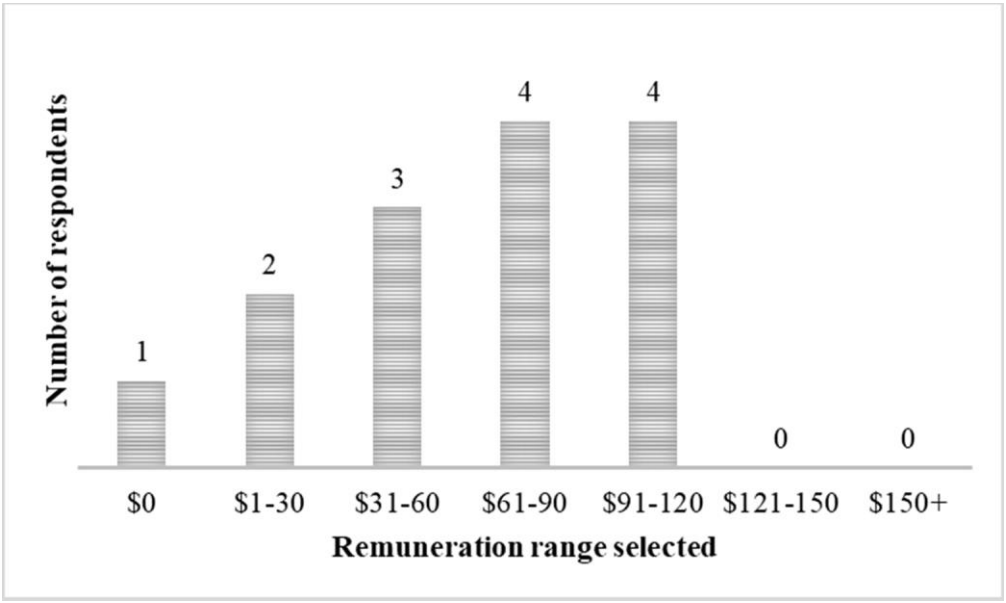
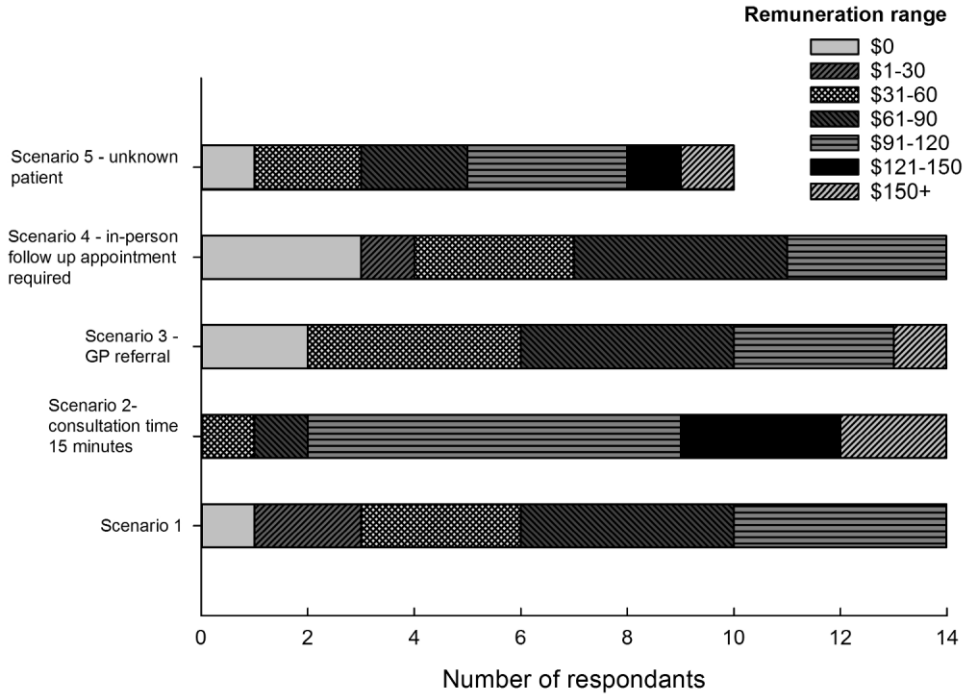
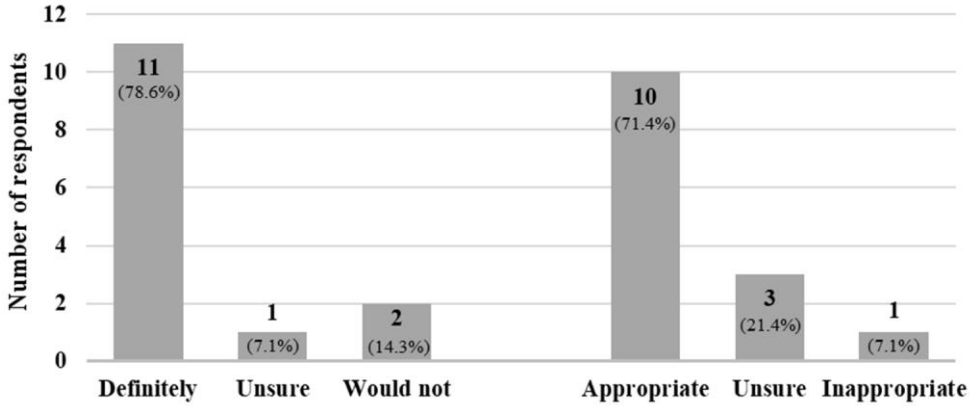


Figure 3. Consultation decision and appropriateness

Figure 3 shows the results for the 2 Likert scale questions regarding the appropriateness and likelihood that respondents would undertake the consult described in the initial scenario.


Number of respondents
1
2
3
4
4
0
0
$0
$1-30
$31-60
$61-90
$91-120
$121-150
$150+
Remuneration range selected


Remuneration range
$0
$1-30
$31-60
$61-90
$91-120
$121-150
$150+
Scenario 5 - unknown patient
Scenario 4 - in-person follow up appointment required
Scenario 3 - GP referral
Scenario 2- consultation time 15 minutes
Scenario 1
0
2
4
6
8
10
12
14
Number of respondants



For the initial scenario, given the choice, would you undertake the teledermoscopy review?

For the initial scenario, how appropriate do you think it is to use teledermoscopy for the situation described?