

Impact of Accessible Skin Cancer Screening and Early Detection on Healthcare Cost

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INTRODUCTION

The Sun Bus is a nonprofit mobile dermatology clinic that was launched in May 2019 that has a mission to reduce the burden of skin diseases, including cancer, through effective screening, education, and research programs.



This study focuses exclusively on evaluating the financial impact of skin cancer screening based on our 2023-2024 tour. Recently, the United States Preventive Services Task Force did not recommend widespread skin cancer screening for adults due to insufficient high-quality evidence of its effectiveness in reducing skin cancer mortality. However, it included strong evidence that early detection of skin cancers improves patient survival rate. Our aim is to assess the economic impact of skin spots identified as suspicious precancerous or cancerous, recognizing that the American Academy of Dermatology has highlighted that the treatment cost of skin cancer is a significant financial burden, exceeding \$8 billion per year.

OBJECTIVES

- Determine if skin cancer screening and early detection can reduce healthcare costs
- Evaluate the cost effectiveness of the Sun Bus screening program
- Determine areas of intervention/improvement within the program.

METHODS

- 1,464 participants screened during the 2023-2024 Sun Bus tour and data collected using the ModMed EMR system
- Follow-up with participants with a suspicious melanoma by phone call to confirm the accuracy of diagnosis
- 6 months post-screening anonymous survey data used as independent metric of compliance and accuracy
- Lesion frequency was integrated with direct healthcare costs of melanoma treatment/ stage adjusted to 2023 (Guy *et al.* 2011) to estimate the costs with and without intervention
- Global Burden of Disease Database (2019) provided disability-adjusted life-years lost/case of skin cancer in the US
- Indirect cost was determined by integrating morbidity and mortality metrics with cancer incidence on The Sun Bus and informed assumptions regarding rate of undiagnosed progression.

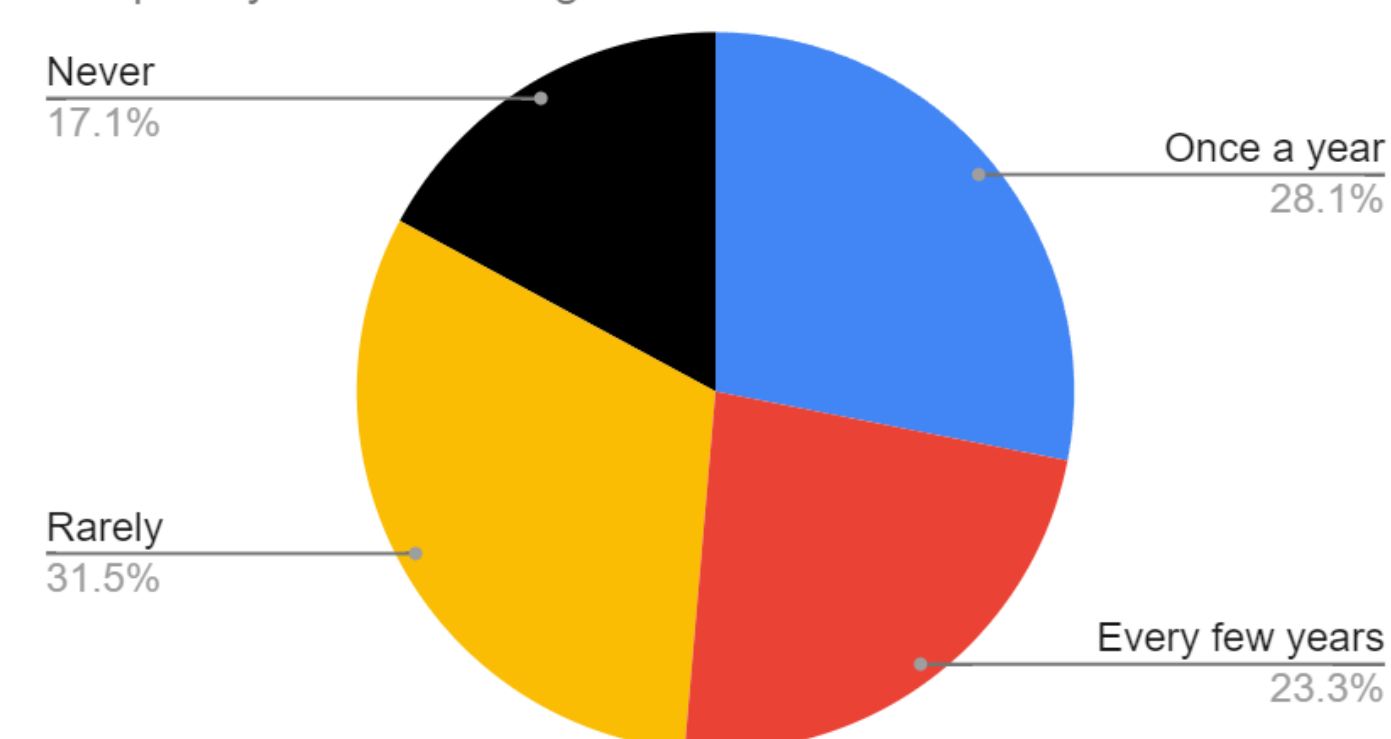
RESULTS

2023-2024 Sun Bus Tour Data

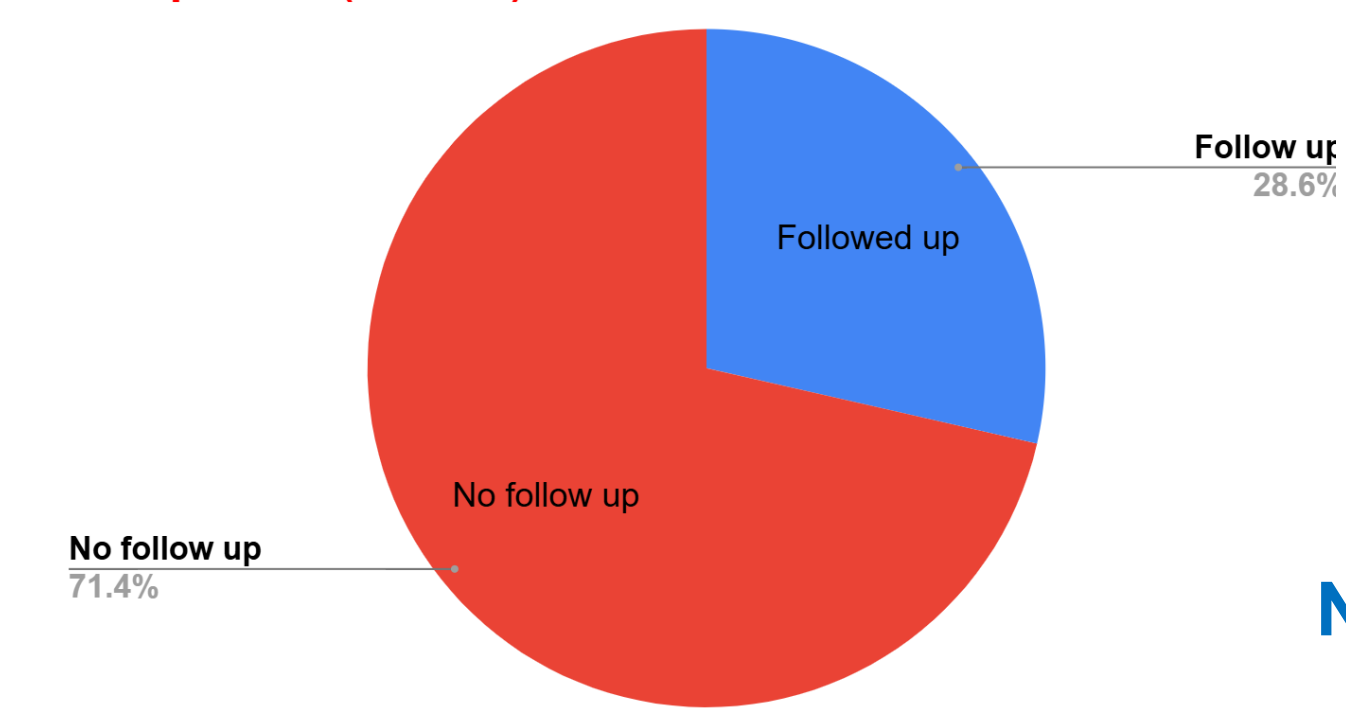
Total # Screenings	Total Suspicious Spots	Actinic Keratosis	Basal Cell Carcinoma	Squamous Cell Carcinoma	Melanoma
1,464	434	270 (62.2%)	80 (18.4%)	43 (9.9%)	41 (15.1%)

Accuracy of diagnosis & compliance with screening recommendations:

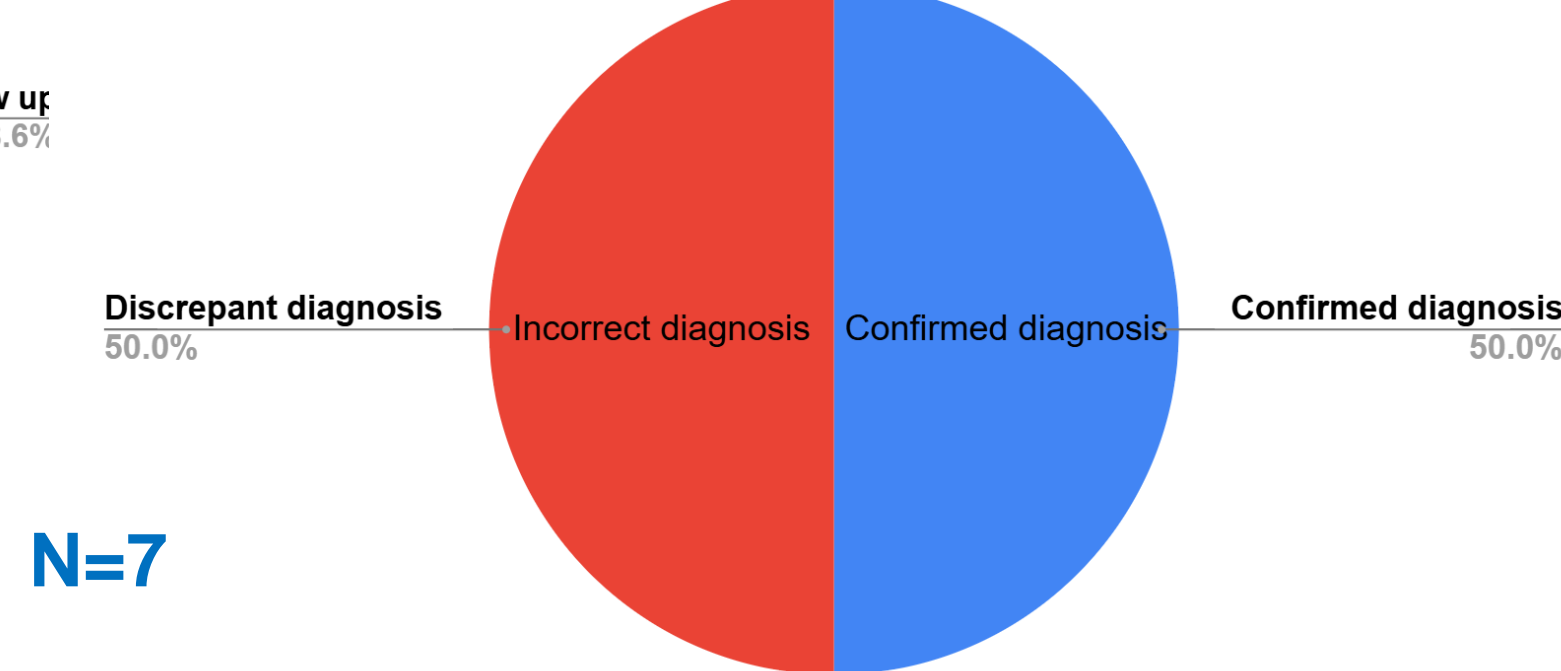
Frequency of Dermatological Visits



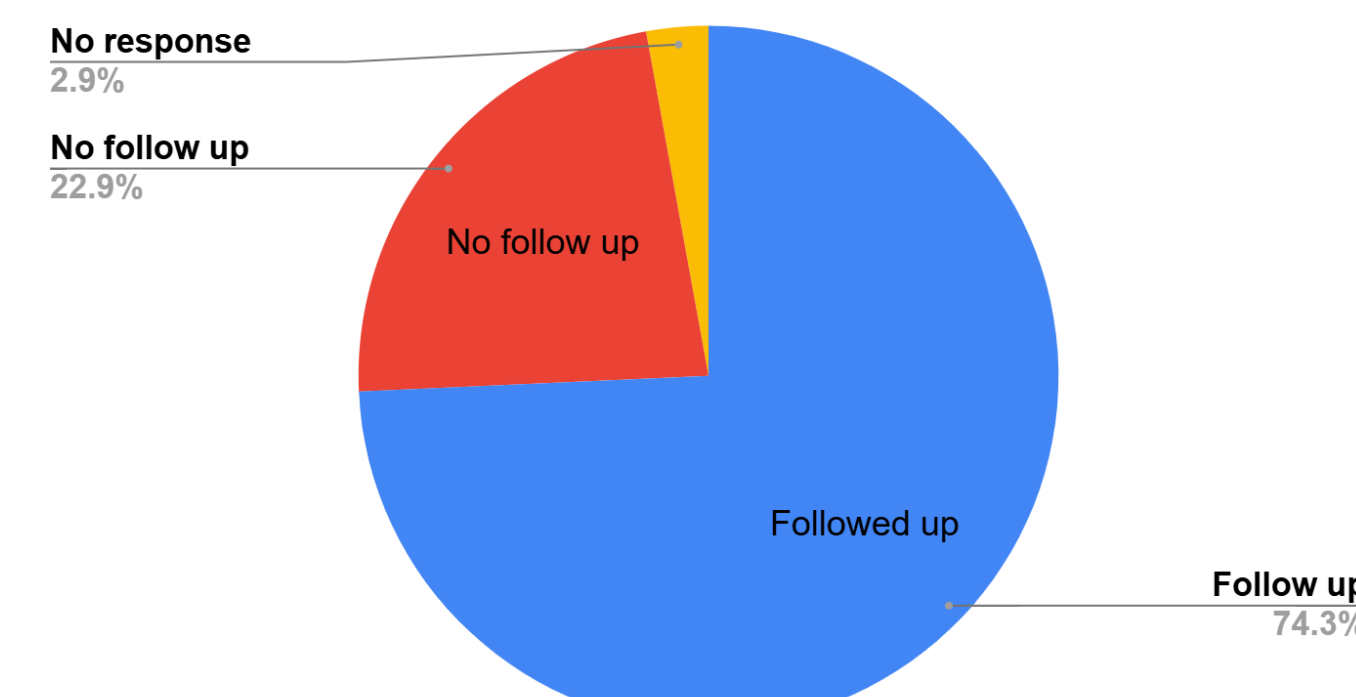
Compliance (Manual)



Diagnosis Accuracy (Manual)



Compliance (Survey)



Indirect Cost:

	Prevalence (cases)	Disability adjusted life years lost	Disability adjusted life years lost/case	Value of DALY*	Mortality & morbidity cost/case
Melanoma	651,437.42	308,801.00	0.474	\$125,000	\$59,253.77
NMSK	2,044,230.6	148,536.47	0.0726	\$125,000	\$9,082.66

Direct Costs of Melanoma:

High Threshold:

Frequency of Dermatological Care:	Stage lesion found at with screening:	Lesion progression w/o screening:	Cost savings/case:	
28%	Once a year	Stage 0	Stage 1	\$4,717.16
23%	Every few years	Stage 0	Stage 2	\$18,729.41
32%	Rarely	Stage 0	Stage 3	\$34,490.36
17%	Never	Stage 0	Stage 4	\$37,968.14

Low Threshold:

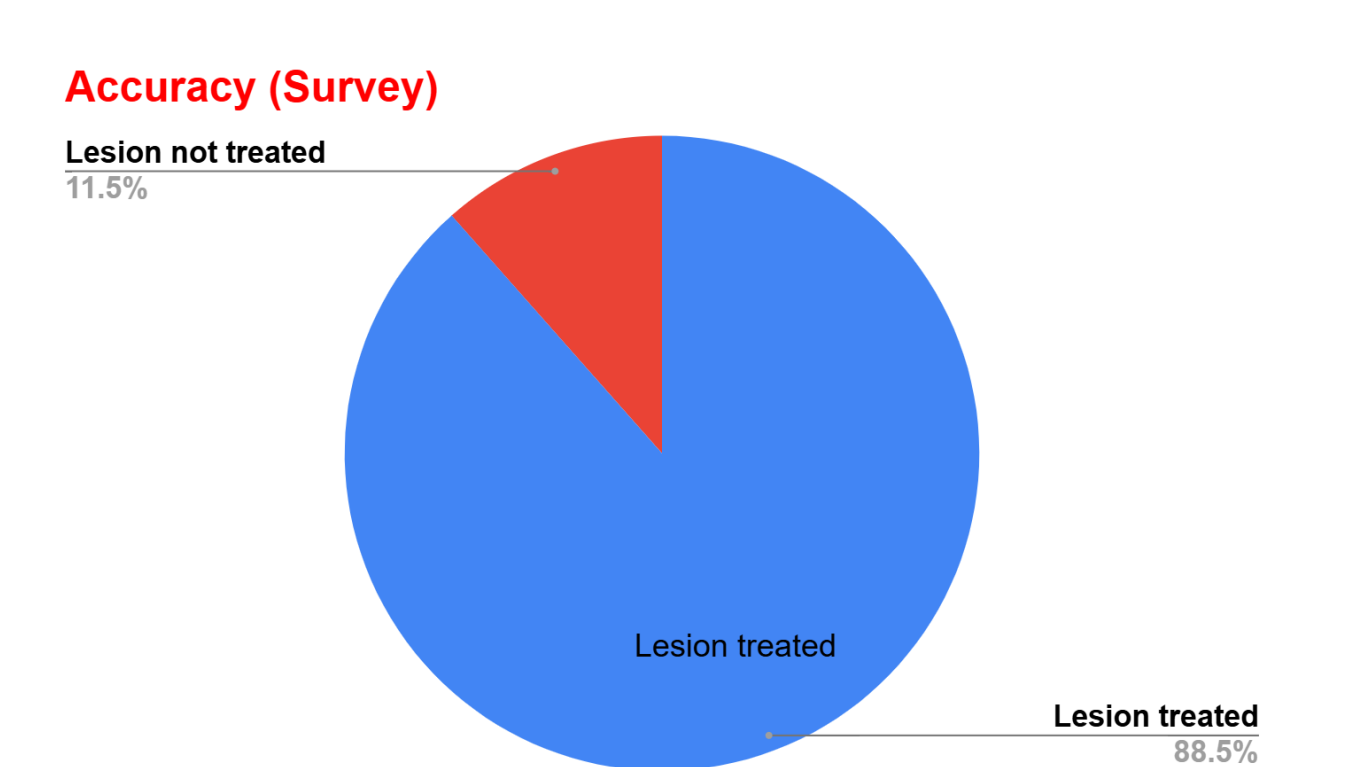
Frequency of Dermatological Care:	Stage lesion found at with screening:	Lesion progression w/o screening:	Cost savings/case:	
28%	Once a year	Stage 1	Stage 1	\$0
23%	Every few years	Stage 1	Stage 2	\$14,012.25
32%	Rarely	Stage 1	Stage 3	\$29,773.21
17%	Never	Stage 1	Stage 4	\$33,250.98

Adjusted Indirect Cost:

	Raw cost of total cases seen on bus	% of costs not accounted for early detection	Accuracy	Compliance	Total indirect costs at manual compliance
Melanoma	\$2,429,404	48%	50%	28%	\$145,764.2
NMSK	\$1,008,175	20%	50%	28%	\$25,204.39

	Cost (\$)	Net \$ savings:
Screening	\$230,720.78	n/a
Savings at Manual Compliance	\$361,660.25	\$130,939.47
Savings at Median Compliance	\$588,455.55	\$357,734.77
Savings at Survey Compliance	\$845,984.79	\$615,264.01

Accuracy (Survey) N=35



Total Cost Range:

	Low end cost savings at manual compliance 28%	Low end cost savings at median compliance 50%	Low end cost savings at survey compliance 74%
Indirect melanoma	\$166754.33	\$291528.56	\$433211.44
Indirect NMSC	\$28833.82	\$50408.78	\$74907.45
Direct Melanoma	\$107512.09	\$187958.21	\$279305.90
Skin check Cost (\$40 copay)	\$58560	\$58560	\$58560
	\$361,660.25	\$588,455.55	\$845,984.79

CONCLUSION & FUTURE DIRECTIONS

- Early detection represents an effective approach to alleviating the financial burden of skin cancer
- The Sun Bus screening program demonstrates a moderate to substantial cost savings for the healthcare system
- Led to implementation of a new "triage based" follow-up on the bus to increase compliance
- Assessing other means of increasing compliance: phone calls, direct messages etc.
- Determining the economic impact of early detection of precancers
- The Impact of The Sun Bus sun safety and skin cancer educational programs
- Collaboration with economics experts at U of Wyoming & Washington will lead to a more precise estimation of the financial impact of preventive care on the healthcare system.

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