Community Outreach and Engagement for Liver Disease Prevention (COELD)

NOSOTROS COMPROMETIDOS A SU SALUD

DESDE 2014

ANNUAL
REPORT
2023

COELD 2023
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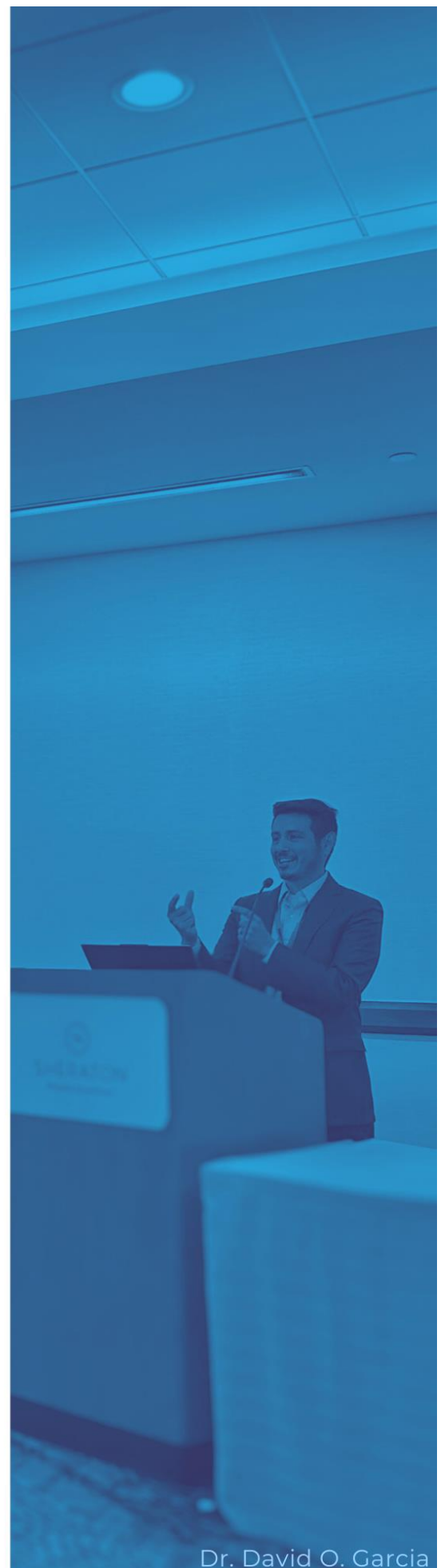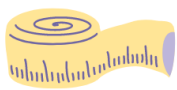
Dr. David O. Garcia

BACKGROUND

Purpose

Metabolic dysfunction-Associated Steatotic Liver Disease (MASLD) formerly known as Non-Alcoholic Fatty Liver Disease (NAFLD) is a type of liver disease that affects 35% of North and South America, giving these regions the highest prevalence rate in the world.[1] The condition is characterized by an accumulation of fat in the liver, unrelated to the consumption of alcohol. The term MASLD replaces the now-retired term Non-Alcoholic Fatty Liver Disease (NAFLD).

Those affected include people of all ages, including children, and it is one of the major causes of chronic liver disease, cirrhosis, and hepatocellular carcinoma. In addition to the accumulation of fat in the liver, individuals must also have one of the following cardiometabolic risk factors for diagnosis[2]:

Cardiometabolic Risk Factors for MASLD Diagnosis

Body Measurements	Blood Sugar	Blood Pressure	Triglycerides	HDL Cholesterol
Body Mass Index (BMI) of 25 or higher, (23 or higher for Asian populations) Waist Circumference over 94 cm for men and over 80cm for women, with adjustments for ethnicity	Fasting blood sugar level of 100mg/dL or higher (5.6mmol/L or higher) Blood sugar level of 140 mg/dL or higher (7.8 mmol/L or higher two hours after eating Hemoglobin A1c (HbA1c) of 5.7% or higher On medication for blood sugar control	Blood pressure of 130/85 mmHg or higher On medication for higher blood pressure	Blood triglyceride levels of 150 mg/dL or higher (1.70 mmol/L or higher) On medication for high triglycerides	HDL cholesterol ("good" cholesterol) less than 40 mg/dL or higher (1.0mmol/L) for men HDL cholesterol less than 50 mg/dL (1.3 mmol/L for women On medication for low HDL cholesterol

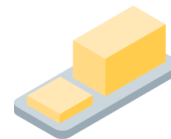Over time, MASLD can progress to metabolic dysfunction-associated steatohepatitis (MASH), advanced cirrhosis, liver cancer, or liver failure. In addition, individuals who are overweight or obese, have diabetes, and high levels of cholesterol or triglycerides are at greater risk for developing fatty liver, since MASLD hepatic manifestation of metabolic syndrome.[3] Additionally, adults of Mexican origin, who make up most of the study population, may have a genetic predisposition to MASLD severity and progression.[4]

Early detection and screening efforts for MASLD are crucial in disease prevention. Fibroscan® is an effective non-invasive tool that assesses levels of fat and scarring of the liver, known as steatosis and fibrosis, respectively.

However, access to Fibroscan® is often limited for the community. Compounding these limitations, factors such as low English proficiency, lack of insurance, or underinsurance make obtaining liver disease screenings more challenging, thereby increasing the risk of adverse health outcomes.[5] To address these barriers, Nosotros – Comprometidos a Su Salud provides screening efforts employing the Fibroscan® device to offer free liver scans within community-based settings. This screening effort aims to identify liver steatosis and fibrosis and assess demographic and lifestyle characteristics among Southern Arizona populations.

The objective of the Community Outreach and Engagement for Liver Disease report is to inform community members about the prevalence of liver steatosis and fibrosis in Southern Arizona. Moreover, the report aims to inform and assist in developing future strategies for the treatment and prevention of liver disease in Southern Arizona.

Methods

The COELD screening efforts conducted numerous studies throughout Southern Arizona in Tucson, Nogales, and Yuma. A team of 2-4 trained staff received participants' informed consent, conducted brief questionnaires, and performed liver scans via Fibroscan® on eligible participants. Individuals were not eligible if they were pregnant, under the age of 18, or if they had an implantable electronic device.

The effort also completed two non-research scan days (Nosotros Liver Day and El Día Del Campesino in Yuma) without research criteria; therefore, some participants were scanned without the required 3-hour fasting that is usually required.

Fibroscan®

The Fibroscan® measures levels of steatosis and fibrosis in the liver using transient elastography. This allows for quick and immediate results to be given in less than 15 minutes. The levels of steatosis are given through a Controlled Attenuation Parameter (CAP) score, with a range of 100-400 decibels milliwatt (dB/m). A CAP score ≥ 248 indicates fatty liver. Fibrosis levels are measured in kilopascals (kPa), ranging from 2.5 kPa to 75 kPa.

The steatosis and fibrosis categories used in this study are shown below:

Fibrosis Result	<7.9 kPa	7.9 - < 8.8 kPa	8.8 - < 11.7 kPa	≥ 11.7 kPa
Fibrosis Category	F0 to F1	F2	F3	F4
	No liver scarring or mild liver scarring	Moderate liver scarring	Severe liver scarring	Advanced liver scarring (Cirrhosis)

CAP Score	Steatosis Grade
<248 dB/m	S0 - None
248-268 dB/m	S1 - Mild
268-280 dB/m	S2 - Moderate
≥ 280 dB/m	S3 - Significant

Fibroscan® Interpretation

Abnormal levels of fat in the liver (CAP Score ≥ 248) increase the risk of abnormal levels of scarring due to increased inflammation impairing its function. This also puts the individual at higher risk of cell death and therefore cirrhosis or even cancer.

Referral Guidelines

Participants were referred to our clinical partner, Arizona Liver Health, based on their CAP and kPa scores: ≥ 280 CAP Score and ≥ 6 kPa; OR ≥ 8 kPa. These participants were informed that they would receive another free Fibroscan® and potential treatment if they were eligible for the clinical trials offered by Arizona Liver Health.

WHO WE ARE

Nosotros Team 2023

Nosotros Comprometidos a Su Salud (Committed to Your Health) is a public health program based in the Mel and Enid Zuckerman College of Public Health, University of Arizona Health Sciences, which fosters community-engaged research collaborations, service, and education to advance health equity in Southern Arizona. The Nosotros program was established in 2014 by Dr. David O. Garcia and Dr. Luis Valdez, and has been working ever since to provide the community with valuable health resources.

To learn more about Nosotros program visit our website at:

https://publichealth.arizona.edu/outreach/nosotros-comprometidos-su-salud

Nosotros works closely with under-resourced and underserved Mexican-origin and other Hispanic communities who experience health inequities. Our mission is to reduce health disparities faced by Mexican-origin communities and other Hispanic communities in Southern Arizona.

Nosotros Service Area

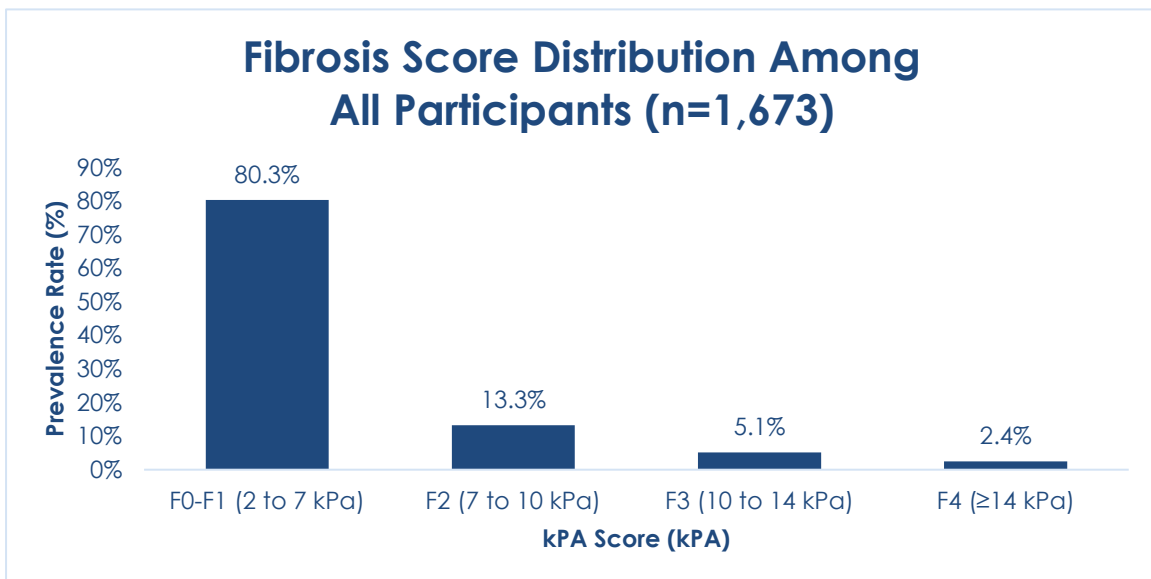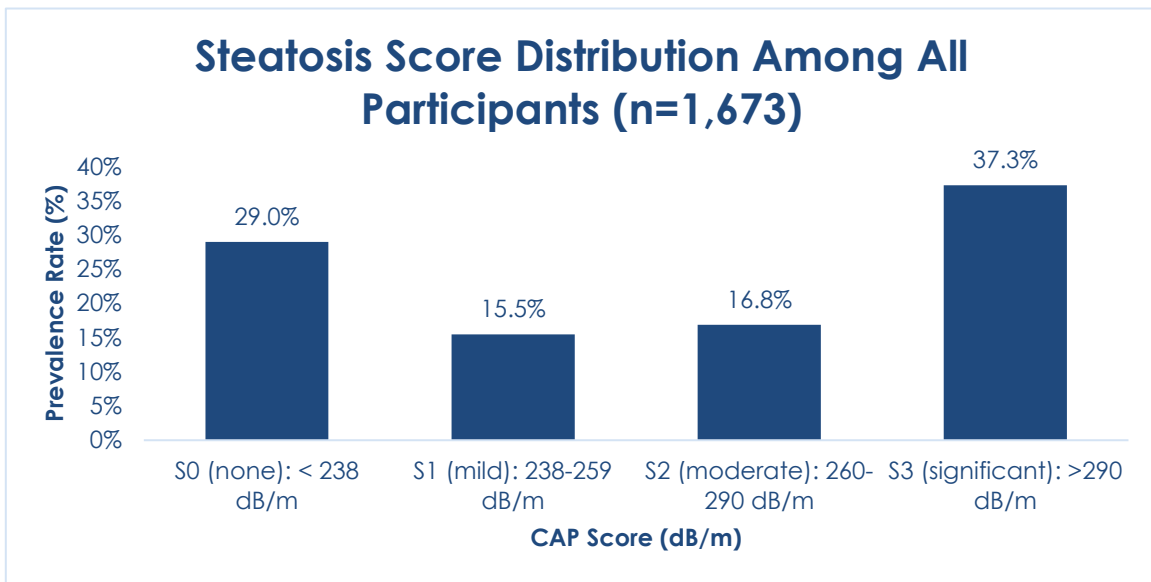Areas served in 2023 include Tucson, Nogales, and Yuma.

RESULTS-RESEARCH & OUTREACH EFFORTS

1,673 total scans were completed in 2023

1,478 were completed through research

195 were completed through community outreach efforts

Fibroscan® Results:

Steatosis Score Distribution Among All Participants (n=1,673)

Prevalence Rate (%)

- S0 (none): < 238 dB/m — 29.0%
- S1 (mild): 238-259 dB/m — 15.5%
- S2 (moderate): 260-290 dB/m — 16.8%
- S3 (significant): >290 dB/m — 37.3%

CAP Score (dB/m)

Fibrosis Score Distribution Among All Participants (n=1,673)

Prevalence Rate (%)

- F0-F1 (2 to 7 kPa) — 80.3%
- F2 (7 to 10 kPa) — 13.3%
- F3 (10 to 14 kPa) — 5.1%
- F4 (≥14 kPa) — 2.4%

kPA Score (kPA)
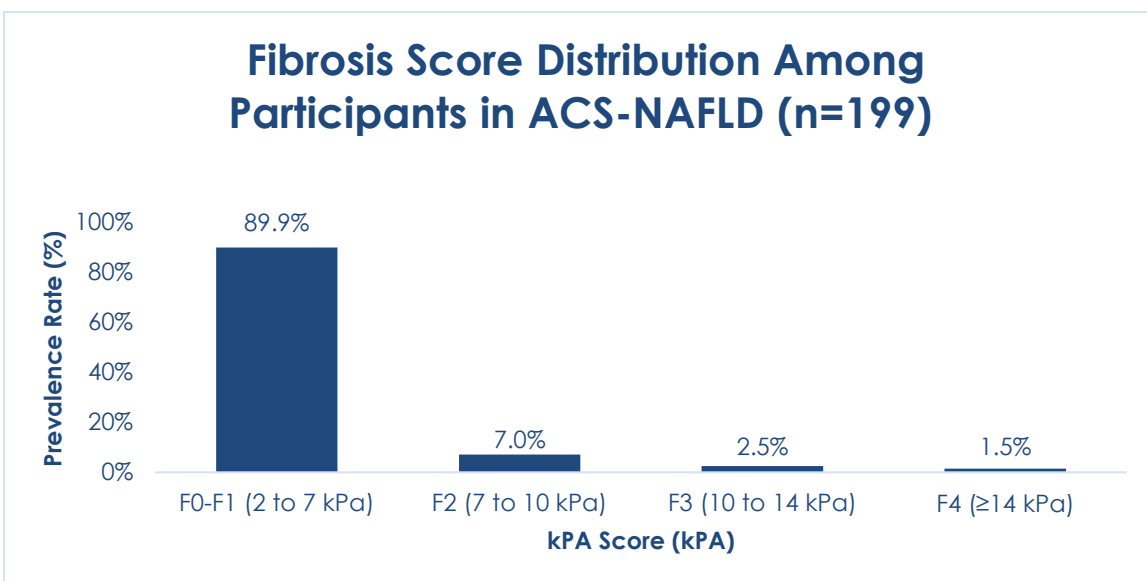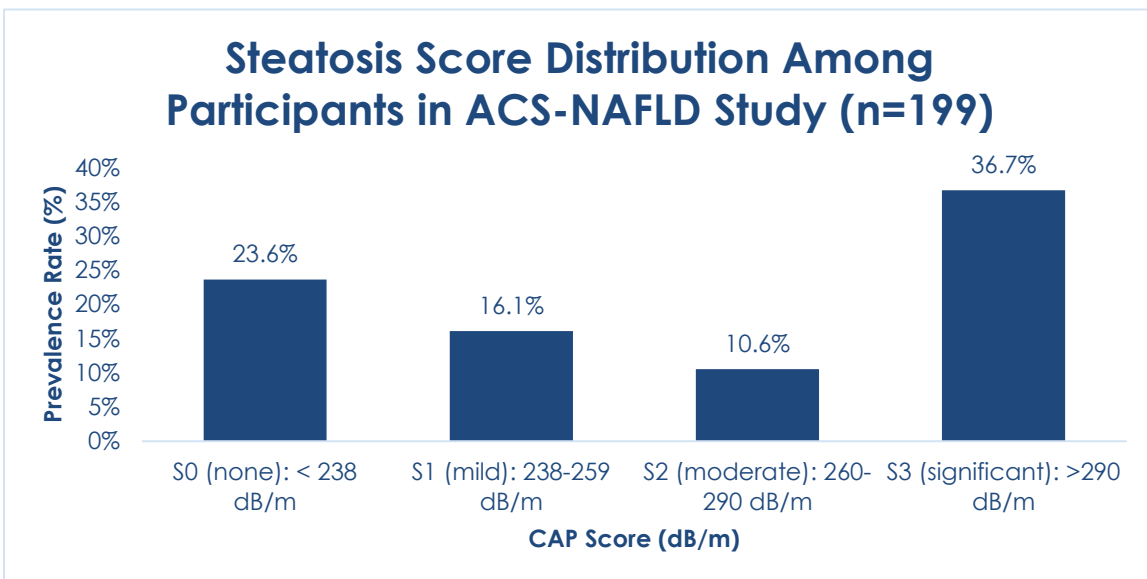
American Cancer Society NAFLD Study (ACS-NAFLD) – 199 Scans

Mexican-origin communities in the Southwest have higher liver cancer rates and mortality compared to the U.S. population. Risk factors include hepatitis B/C, NAFLD, cirrhosis, alcohol use, inactivity, and obesity. Our multidisciplinary team explored how neighborhood and social factors impact liver cancer treatment and prevention, aiming to improve healthcare access and reduce disparities.
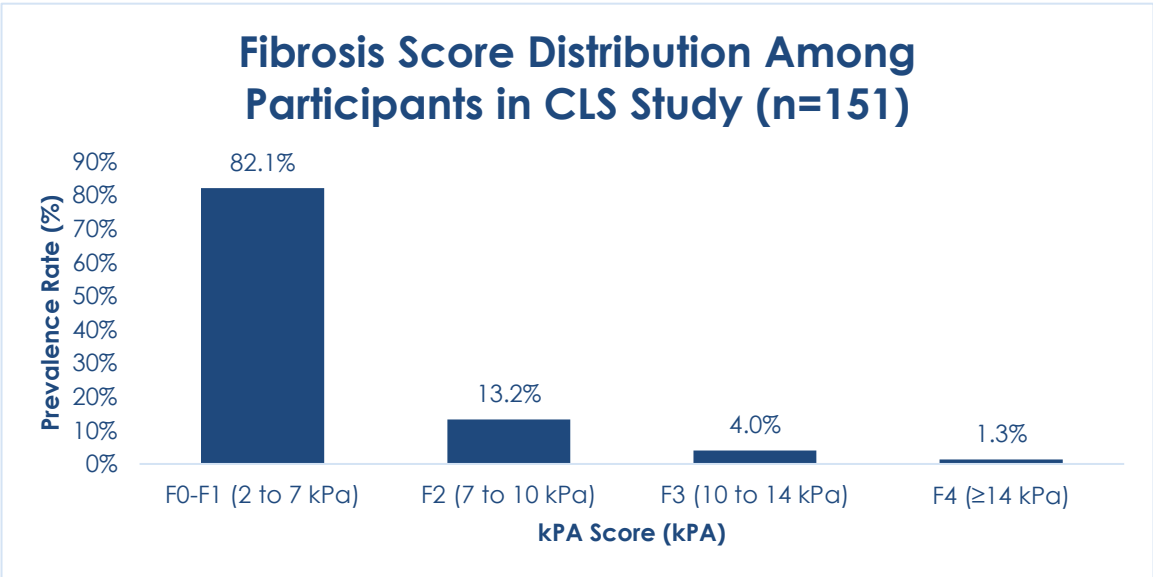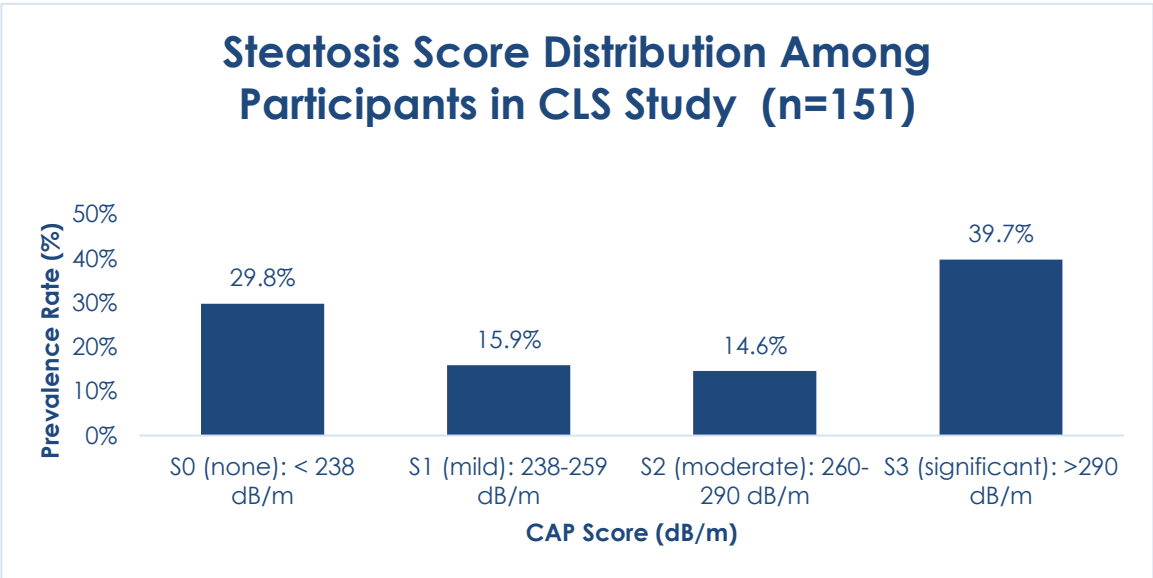
Fibroscan® Results:

Steatosis Score Distribution Among Participants in ACS-NAFLD Study (n=199)

Bar chart — Prevalence Rate (%) vs CAP Score (dB/m):
- S0 (none): < 238 dB/m — 23.6%
- S1 (mild): 238-259 dB/m — 16.1%
- S2 (moderate): 260-290 dB/m — 10.6%
- S3 (significant): >290 dB/m — 36.7%

Fibrosis Score Distribution Among Participants in ACS-NAFLD (n=199)

Bar chart — Prevalence Rate (%) vs kPA Score (kPA):
- F0-F1 (2 to 7 kPa) — 89.9%
- F2 (7 to 10 kPa) — 7.0%
- F3 (10 to 14 kPa) — 2.5%
- F4 (≥14 kPa) — 1.5%

Cosechando La Salud (CLS) Study – 151 Scans

MASLD affects 43% of Mexican-origin adults in the U.S., but its risk among migrant farmworkers is unstudied. Cosechando la Salud and Campesinos sin Fronteras explored how neighborhood factors and levels of stress impact MASLD status in migrant and seasonal farmworkers in Yuma, AZ.
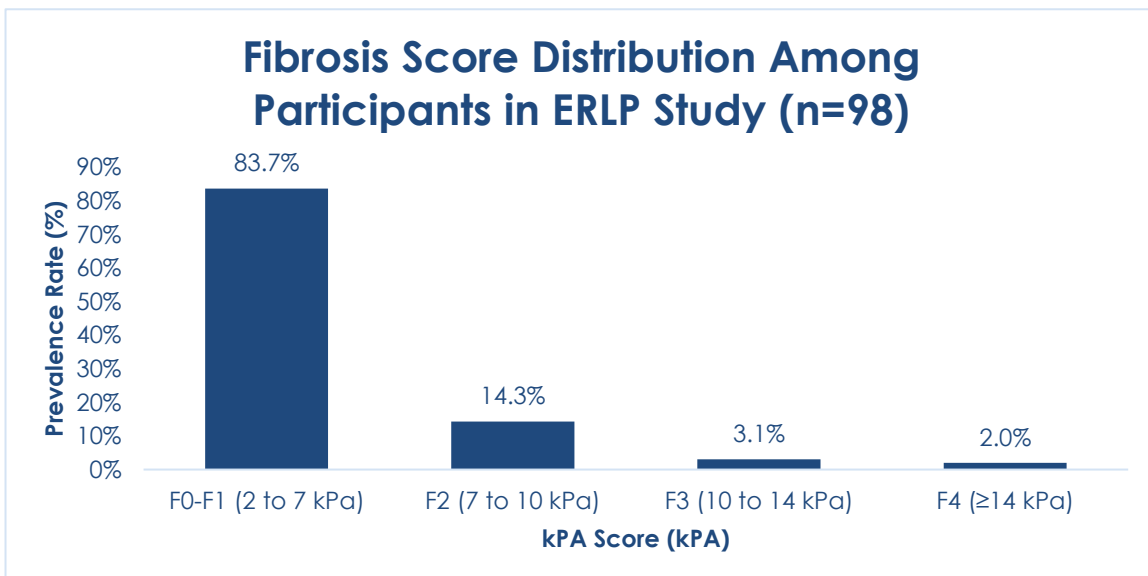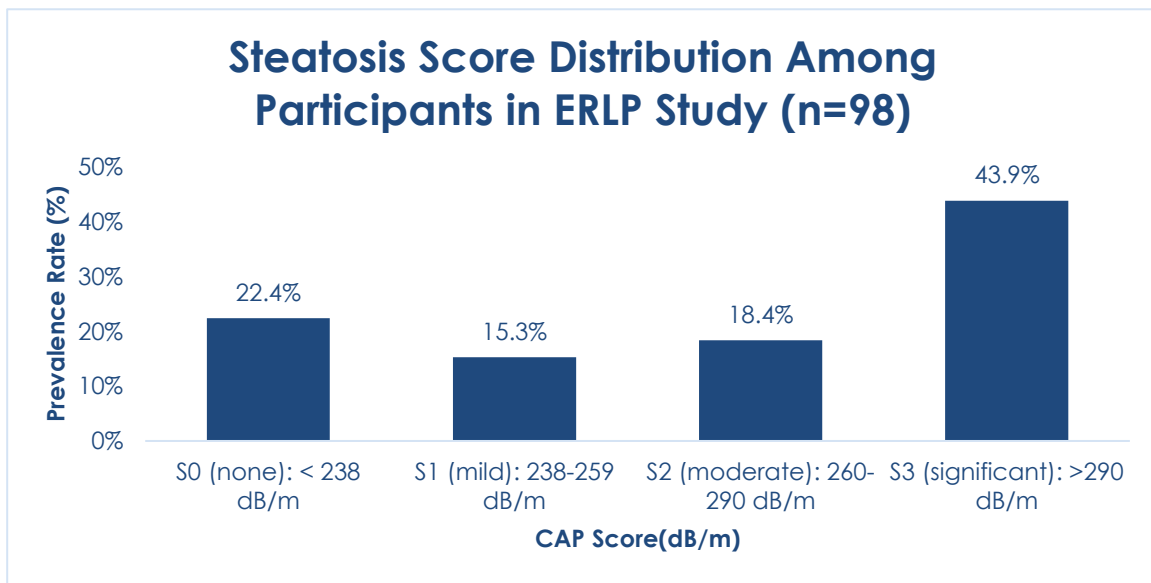
Fibroscan® Results:

Steatosis Score Distribution Among Participants in CLS Study (n=151)

CAP Score (dB/m)	Prevalence Rate (%)
S0 (none): < 238 dB/m	29.8%
S1 (mild): 238-259 dB/m	15.9%
S2 (moderate): 260-290 dB/m	14.6%
S3 (significant): >290 dB/m	39.7%

Fibrosis Score Distribution Among Participants in CLS Study (n=151)

kPA Score (kPA)	Prevalence Rate (%)
F0-F1 (2 to 7 kPa)	82.1%
F2 (7 to 10 kPa)	13.2%
F3 (10 to 14 kPa)	4.0%
F4 (≥14 kPa)	1.3%

El Rio Liver Project – 98 Scans

Nosotros collaborated with the El Rio Community Health Center to implement a community-based risk assessment for obesity-related diseases and facilitate COVID-19 vaccinations at the Tanque Verde Swap Meet. Grounded in trust and community relevance, this community-based effort promoted regular access to health communication, information, and opportunities to participate in risk reduction programs at El Rio and Nosotros. Individuals were referred to receive COVID-19 vaccination/boosters from El Rio onsite and follow-up care or enrollment into existing programs/research (e.g., weight management programs, etc.).
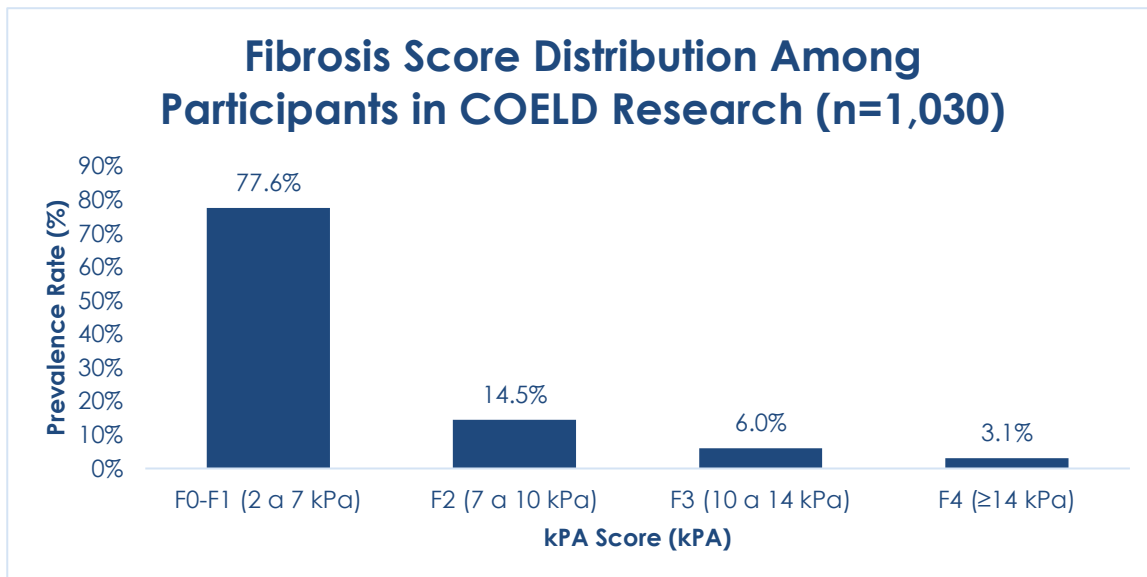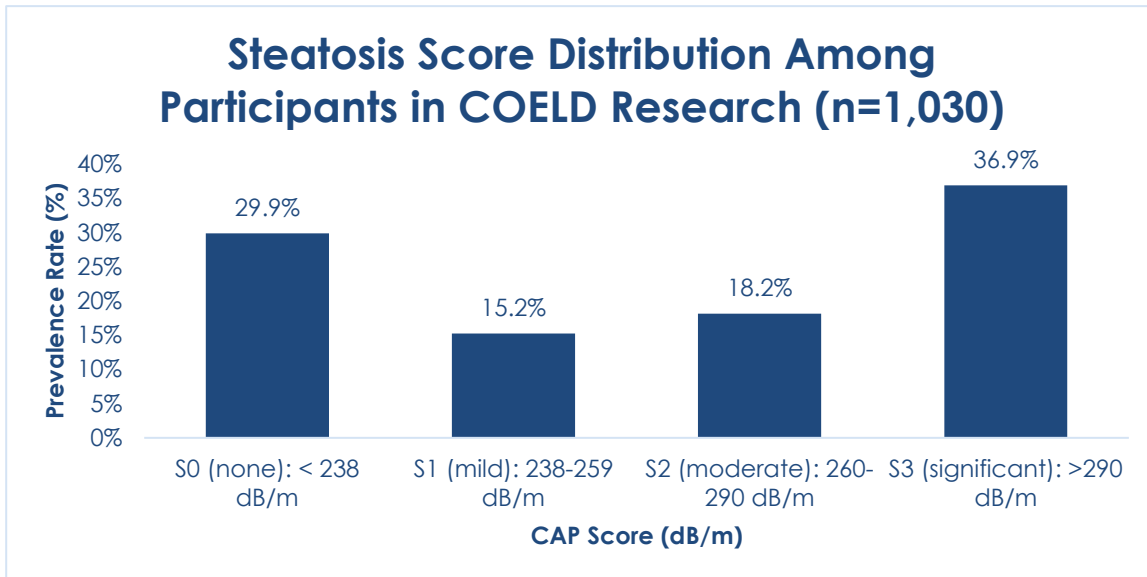
Fibroscan® Results:

Steatosis Score Distribution Among Participants in ERLP Study (n=98)

Bar chart — Prevalence Rate (%) vs CAP Score(dB/m):
- S0 (none): < 238 dB/m — 22.4%
- S1 (mild): 238-259 dB/m — 15.3%
- S2 (moderate): 260-290 dB/m — 18.4%
- S3 (significant): >290 dB/m — 43.9%

Fibrosis Score Distribution Among Participants in ERLP Study (n=98)

Bar chart — Prevalence Rate (%) vs kPA Score (kPA):
- F0-F1 (2 to 7 kPa) — 83.7%
- F2 (7 to 10 kPa) — 14.3%
- F3 (10 to 14 kPa) — 3.1%
- F4 (≥14 kPa) — 2.0%

COELD Research – 1,030 Scans

Preventive measures and timely diagnosis are crucial to preserving our community's liver health. We utilized the Fibroscan® device in community-based settings to identify the presence of liver steatosis and fibrosis in Southern Arizona populations. We also assessed for public awareness about liver disease and cancer risks and examine the demographic and lifestyle characteristics that will assist in developing future strategies for liver disease and cancer prevention and treatment.
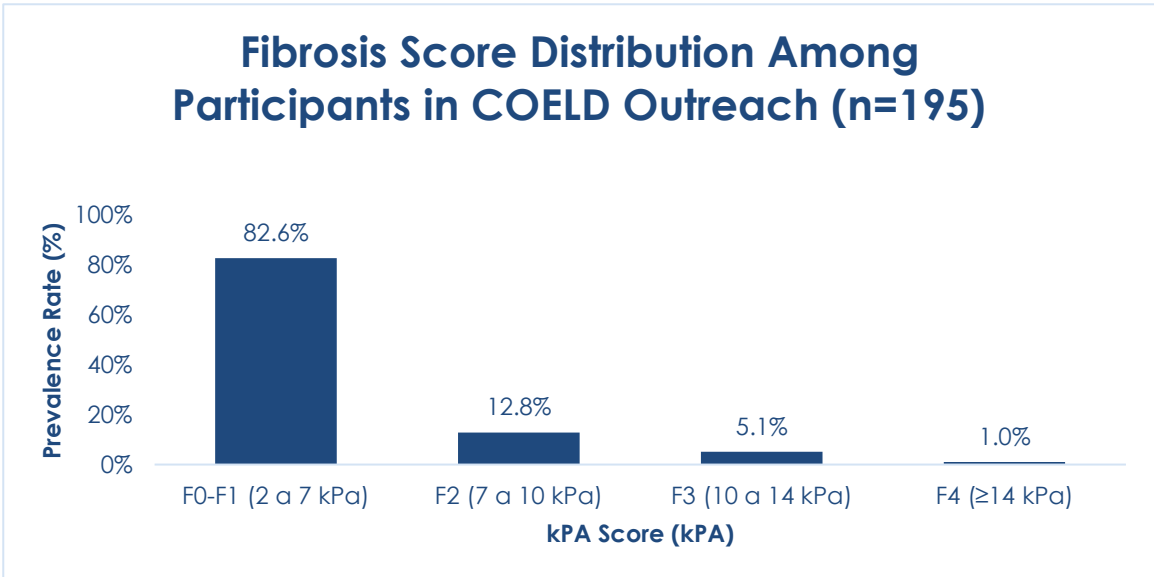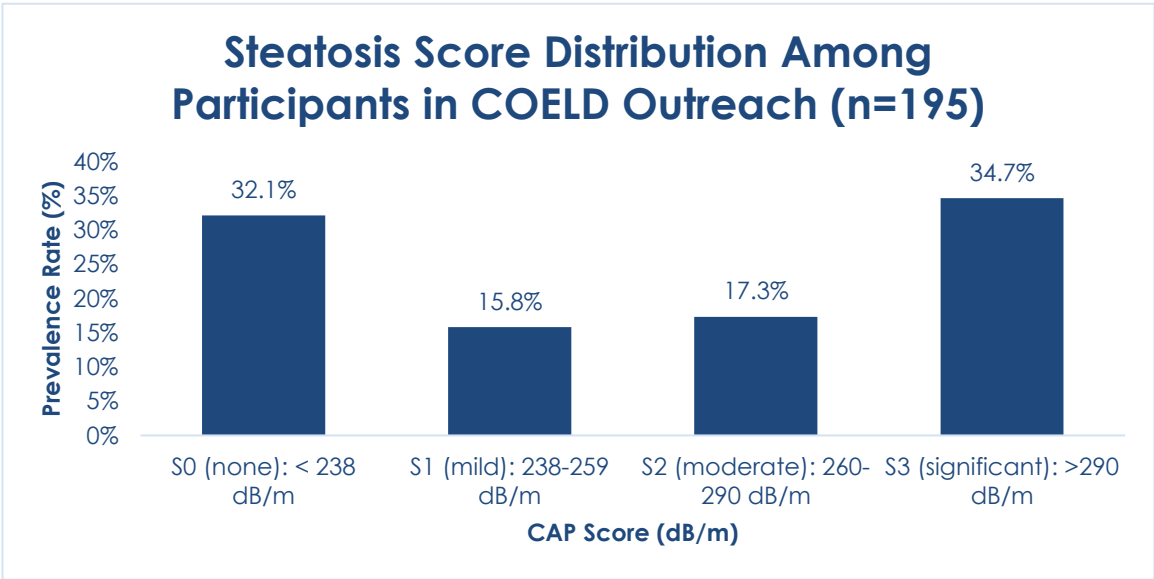
Fibroscan® Results:

Steatosis Score Distribution Among Participants in COELD Research (n=1,030)

Prevalence Rate (%)

- S0 (none): < 238 dB/m — 29.9%
- S1 (mild): 238-259 dB/m — 15.2%
- S2 (moderate): 260-290 dB/m — 18.2%
- S3 (significant): >290 dB/m — 36.9%

CAP Score (dB/m)

Fibrosis Score Distribution Among Participants in COELD Research (n=1,030)

Prevalence Rate (%)

- F0-F1 (2 a 7 kPa) — 77.6%
- F2 (7 a 10 kPa) — 14.5%
- F3 (10 a 14 kPa) — 6.0%
- F4 (≥14 kPa) — 3.1%

kPA Score (kPA)

COELD Outreach – 195 Scans

In addition to our research efforts, Nosotros also provided free Fibroscans® during community events that were not associated with research efforts. Such efforts included our annual *Nosotros Liver Day* and the *Día del Campesino* health fair. During these efforts, our team did not collect any sort of identifying information from those interested in receiving a free Fibroscan®. We also provided information about liver disease risk, and recommendations on healthy lifestyle behaviors in order to promote liver disease awareness and education.

Fibroscan® Results:

Steatosis Score Distribution Among Participants in COELD Outreach (n=195)

Prevalence Rate (%) vs CAP Score (dB/m)

- S0 (none): < 238 dB/m — 32.1%
- S1 (mild): 238-259 dB/m — 15.8%
- S2 (moderate): 260-290 dB/m — 17.3%
- S3 (significant): >290 dB/m — 34.7%

Fibrosis Score Distribution Among Participants in COELD Outreach (n=195)

Prevalence Rate (%) vs kPA Score (kPA)

- F0-F1 (2 a 7 kPa) — 82.6%
- F2 (7 a 10 kPa) — 12.8%
- F3 (10 a 14 kPa) — 5.1%
- F4 (≥14 kPa) — 1.0%

RESEARCH RESULTS:
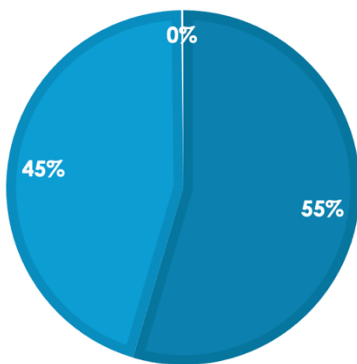
1,478 Total Research Scans

In 2023, we completed an additional of 1,066 scans that took place throughout the year compared to the 603 total scans from 2022. This represents an increase of more than double in free Fibroscans® provided to our Southern Arizona community.

The results shown next represent the information of those obtained through *research* study participants. Such participants provided informed consent, completed questionnaires on personal health behaviors and liver health knowledge, and received the Fibroscan®.

Demographics:

Sex (n=1,478)

■ Male ■ Female ■ Other

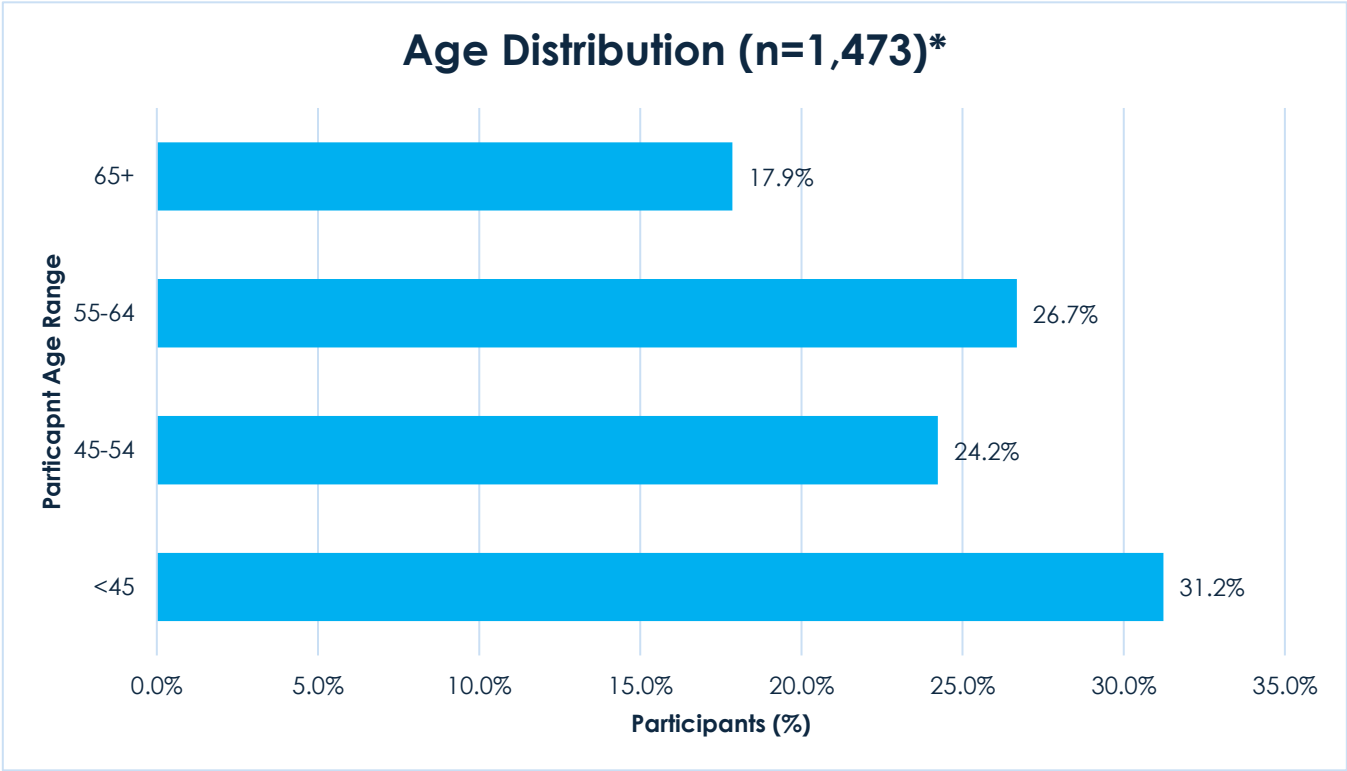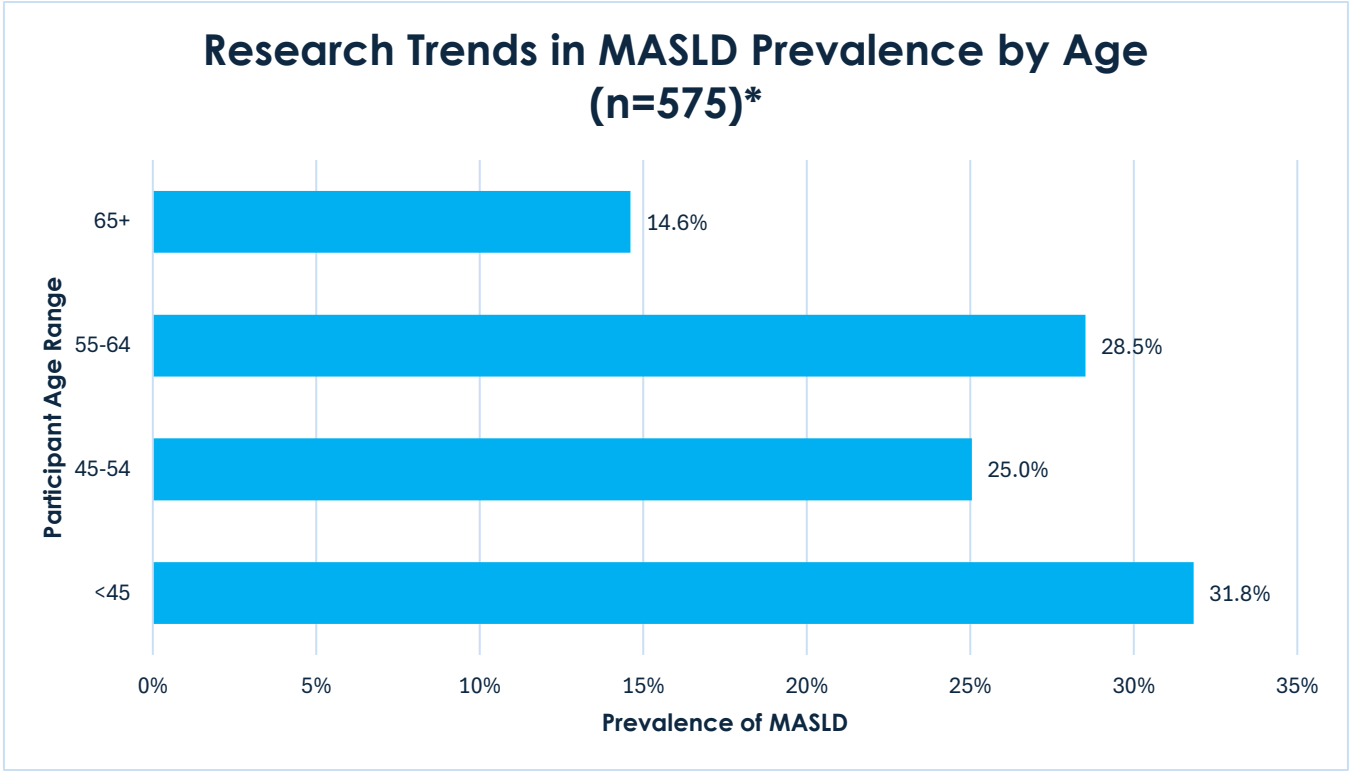
Data Interpretation

The majority of research participants were male, Hispanic, and under the age of 45.

Moreover, the participants who had the highest rates of MASLD (>288 dB/m) were under 45.

**Over ¾ of research participants had a BMI of over 30kg/m². **

Ethnicity (n=1,473)*

■ Hispanic ■ Non-Hispanic

*Missing data in ACS Study

Age Distribution (n=1,473)*

Participant Age Range (y-axis)

- 65+: 17.9%
- 55-64: 26.7%
- 45-54: 24.2%
- <45: 31.2%

Participants (%) (x-axis)

Missing data in ACS Study

Research Trends in MASLD Prevalence by Age (n=575)*

Participant Age Range (y-axis)

- 65+: 14.6%
- 55-64: 28.5%
- 45-54: 25.0%
- <45: 31.8%

Prevalence of MASLD (x-axis)

MASLD considered as Fibrosis score of >288 dB/m via Fibroscan ®

Body Mass Index (BMI) Distribution Among Research Participants (n=1,432)*
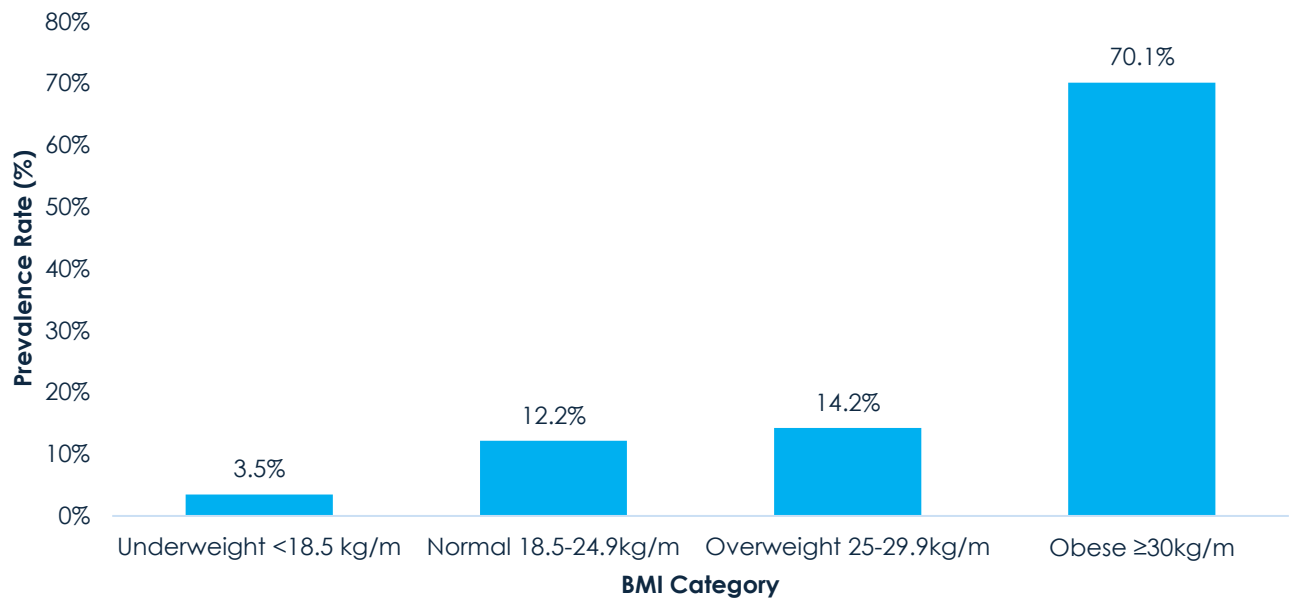
Missing data in ACS Study

PREVIOUS DIAGNOSIS:

Previous Chronic Liver Disease (CLD) Diagnosis (n=1,478)
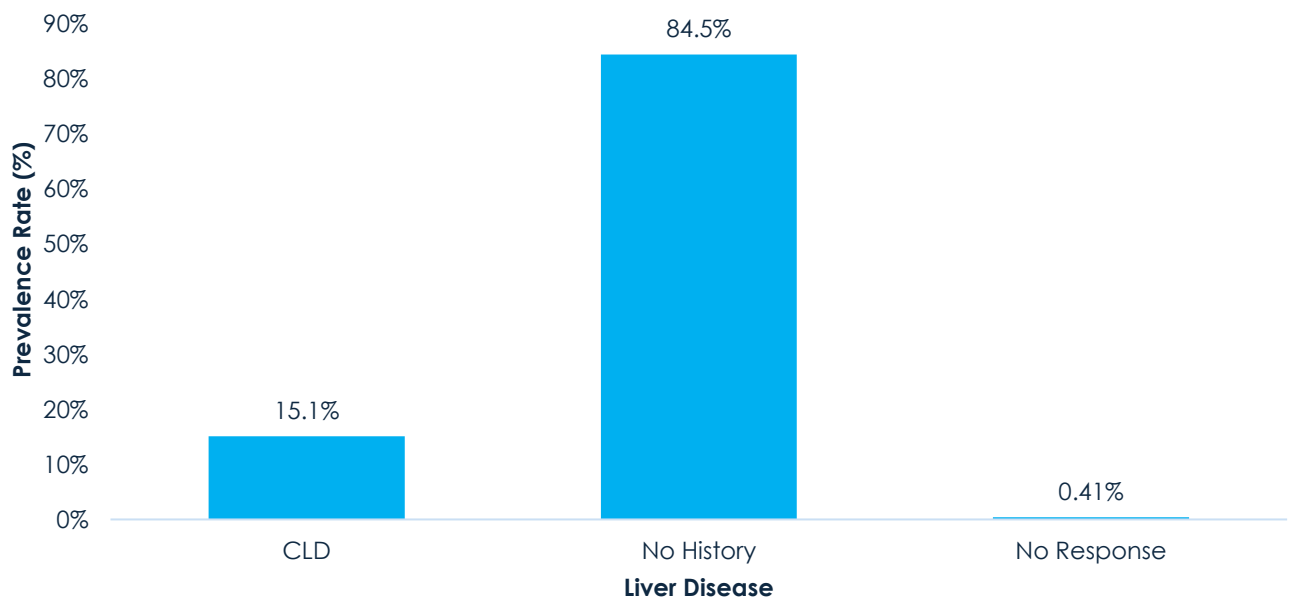
FAMILY HISTORY:

Data Interpretation

The majority of participants reported no prior liver disease diagnosis in the family. It is worth mentioning that genetic susceptibility can be an influencing factor for MASLD development and progression.

Family History of Liver Disease Diagnosis (n=350)*
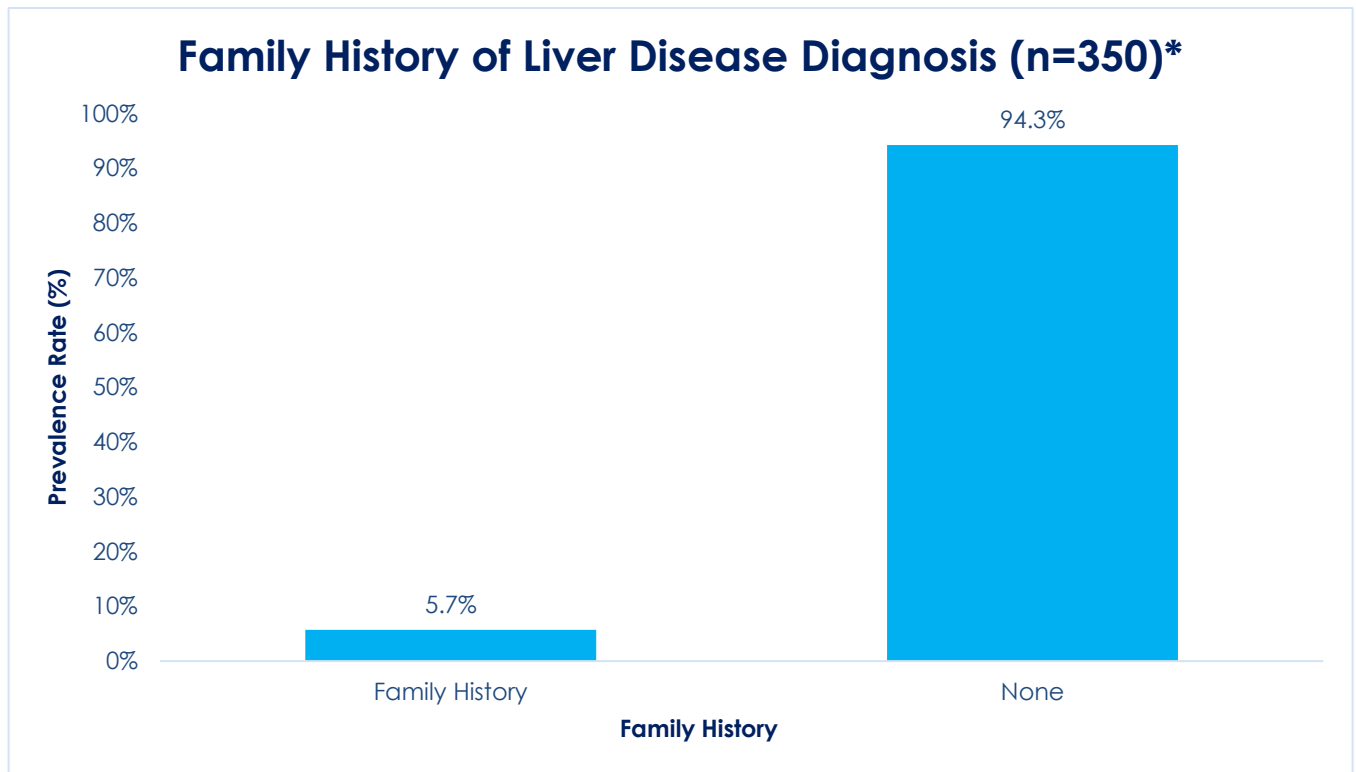
ACS and CLS Studies only

CONCLUSIONS

Findings from the Community Outreach and Engagement for Liver Disease Prevention Report in Southern Arizona emphasize the need for accessible screening tools, like the Fibroscan®, for high-risk communities such as border and Hispanic/Latino populations. Since MASLD is a hepatic manifestation of metabolic syndrome, individuals with conditions like obesity, diabetes, high cholesterol, or high triglycerides are considered high risk and should be screened for MASLD every 2 years.[4]

The findings of our screening efforts indicate a high percentage of Mexican-origin participants have at least one metabolic risk factor. This highlights the necessity for the availability and affordability of non-invasive tools in these communities to prevent liver disease progression. Future steps will help Nosotros reach more communities in Arizona, enhancing support and education for participants.

ACKNOWLEDGEMENTS

The Nosotros team would like to acknowledge the community partners in Southern Arizona who helped us reach participants:

- o Consulate of Mexico in Tucson
- o Consulate of Mexico in Nogales
- o Tanque Verde Swap Meet
- o El Rio Community Health Center
- o Tucson Unified School District Family Resource Centers
- o Menlo Family Resource Center
- o Sahuarita Food Bank
- o Campesinos Sin Fronteras
- o Reyes Maria Ruiz Leadership Academy
- o Our clinical partner, Arizona Liver Health

A special acknowledgment to study participants and the Nosotros staff, both previous and current. Thank you so much for your unconditional support! Lastly, thank you so much to Nicole Cabrera for drafting this report.
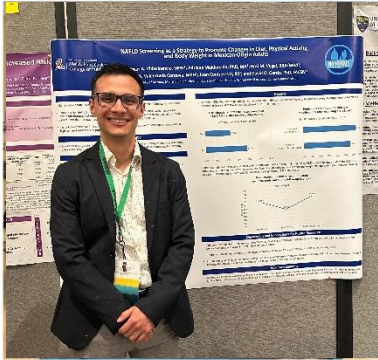
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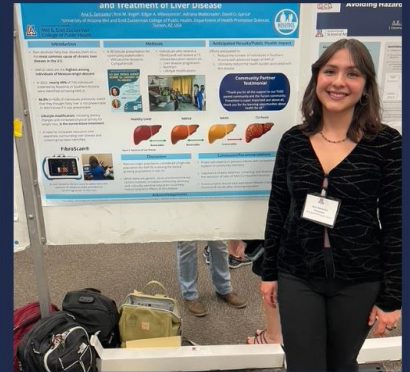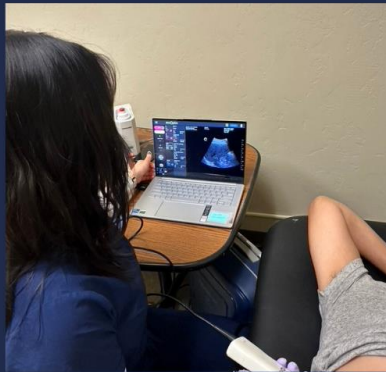
NOSOTROS

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2. Rinella ME, Lazarus JV, Ratziu V, et al. A multisociety Delphi consensus statement on new fatty liver disease nomenclature. Ann Hepatol. 2024;29(1):101133. doi:10.1016/j.aohep.2023.101133
3. Godoy-Matos AF, Silva Júnior WS, Valerio CM. NAFLD as a continuum: from obesity to metabolic syndrome and diabetes. *Diabetol Metab Syndr*. 2020;12:60. Published 2020 Jul 14. doi:10.1186/s13098-020-00570-y
4. Garcia DO, Morrill KE, Lopez-Pentecost M, et al. Nonalcoholic Fatty Liver Disease and Associated Risk Factors in a Community-Based Sample of Mexican-Origin Adults. *Hepatol Commun*. 2022;6(6):1322-1335. doi:10.1002/hep4. 1896
5. Nguyen MP, Amoon AT, Lee L, et al. Health Literacy, Knowledge, and Risk Factors for Fatty Liver Disease among Asian American and Pacific Islanders and Latinos in Los Angeles. *Asian Pac J Cancer Prev*. 2021;22(6):1737-1744. Published 2021 Jun 1. doi:10.31557/APJCP.2021.22.6.1737 4. Francque, S. M., & Dirinck, E. (2023). NAFLD prevalence and severity in overweight and obese populations. *The Lancet Gastroenterology & Hepatology*, *8*(1), 2-3.

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