creating awareness
to empower

SYSTEM RESEARCH SOCIETY

the **team**

a comparative analysis between four localities of Delhi

2022

COVID-19 had far-reaching consequences on the physical and mental health of individuals. The immune system is still weak.
Data collected at the multiple camps held at multiple locales in Delhi will help in identifying the weaknesses and illnesses prominent amongst the respondent group.
SRS plans to cover more cities and states, to help identify common factors affecting peoples' health, paving ways to strengthen the immune system of people.

A REPORT

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Shaping the future for an equitable living, discovering means for a possible sustainable change and sharing the knowledge with the world.

RUNNING + FITNESS + FOOD

3 GOOD HEALTH AND WELL BEING

Introduction

System Research Society is a not-for-profit organization registered in 2008 under the Societies Registration Act, 1860. The society, having a national status, is committed to uplift lives and reinforce solidarity among individuals. The goal is to uphold the dignity of life and serve people, with a focus on empowering individuals by creating awareness.

Covid-19 has taken a toll on people's health and those who got infected are still recovering from the after-effects of this disease. In amidst lockdowns and a shift to online platforms many people were not able to go to hospitals and clinics for doctor's check-ups, some due to the fear of getting infected did not prefer to go out of their homes. To provide check-up opportunities to people, the System Research Society conducted free medical camps in different localities of Delhi.

Over the last 15 years, the number of childhood deaths has been cut in half. This proves that it is possible to win the fight against almost every disease. Still, we are spending an astonishing amount of money and resources on treating illnesses that are surprisingly easy to prevent. The new goal for worldwide Good Health promotes healthy lifestyles, preventive measures, and modern, efficient healthcare for everyone.

The medical camps were held in Burari, Patparganj, Mayur Vihar, and Shastri Nagar. In each location, information on the patients was collected. The data contained their basic information along with the results of their medical tests. Here we have analysed the said datasets to draw out results.

Methodology

The tests which were conducted were as follows:

Hemoglobin is a protein in your red blood cells that carries oxygen to your body's organs and tissues and transports carbon dioxide from your organs and tissues back to your lungs. If a hemoglobin test reveals that your hemoglobin level is lower than normal, it means you have a low red blood cell count (anemia).

Blood pressure is the pressure of blood pushing against the walls of your arteries. Arteries carry blood from your heart to other parts of your body. Hypertension is defined as blood pressure above 140/90 and is considered severe if the pressure is above 180/120.

Blood sugar level, also known as Glycaemia, blood sugar concentration, or blood glucose level is the measure of glucose concentration in the blood of humans. A blood sugar level of less than 140 mg/dL (7.8 mmol/L) is normal. A reading of more than 200 mg/dL (11.1 mmol/L) after two hours indicates diabetes. A reading between 140 and 199 mg/dL (7.8 mmol/L and 11.0 mmol/L) indicates prediabetes.

The bone density test determines if you have osteoporosis — a disorder characterized by bones that are more fragile and more likely to break. The test uses X-rays to measure how many grams of calcium and other bone minerals are packed into a segment of bone, A T score of -1 to +1 is considered normal bone density. A T score of -1 to -2.5 indicates osteopenia. A T score of -2.5 or lower is bone density low enough to be categorized as osteoporosis.

The data collected from the tests conducted in four locations are listed in the table :

	Burari	Patparganj	Mayur Vihar	Shastri Nagar
Blood sugar	Done	Done	Done	Done
Blood pressure	Done	Done	Done	Done
haemoglobin	Done	Done	Not Done	Not Done
Bone density	Not Done	Not Done	Done	Done

We combined the datasets of the four localities so we could study if the health conditions of people are in relation to their income group, age, or gender.

To calculate the bracket for the division of the monthly income per household into lower and higher income groups, we divided the yearly income of a household defined in the BPL criteria by 12, which came out to be 17,000. The data set was divided into four age categories which were as below 20| 20-40 | 40-60 | above 60.

On the basis of the tests that were conducted we performed a comparative analysis between these 4 localities using the chi-square test of independence, proportionality or z tests and other statistical tools.

Hypothesis

In the combined data:

Income level and health

Relationship between income level and blood sugar.
Relationship between income level and blood pressure.
Relationship between income level and haemoglobin.
Relationship between income level and bone density.

Age and Health

Relationship between age and stress (bp) levels of people.
Relationship between age and blood sugar.
Relationship between age and haemoglobin.
Relationship between age and bone density.

Gender and Health

Relationship between Gender and stress (bp) levels of people.
Relationship between Gender and blood sugar.
Relationship between Gender and haemoglobin.
Relationship between Gender and bone density.
Relationship between food habits and health of people (Shastri Nagar data only).

Comparative analysis between the 4 localities on the basis of income level, age and gender

Analysis

Here we are checking whether the 2 variables income level and blood pressure are independent of each other, we set our hypothesis as follows:

Null hypothesis: level of blood pressure is independent of the income of people.

Alternative hypothesis: level of blood pressure is dependent on the income of people.

Through the chi-square test of association, we rejected our null hypothesis at a 5% level of significance which leads to the conclusion that blood pressure is dependent on the income level of the people.
To further find out which income group has a

higher blood pressure we applied the proportion test and we found out that people belonging to the higher income group had higher blood pressure as compared to the lower income group.

Similarly, we conducted a chi-square association test to test the independence of bone density and income level of people.
We rejected our null hypothesis at a 5% level of significance and concluded that there exists an association between income level and bone density of people, furthermore, we also applied the z-test and found out that the lower income group had a larger proportion of people 83% which have borderline osteoporosis.

In this test we are checking the relationship between the age of the people and their sugar level, our hypotheses were as follows:

Null hypothesis: The level of blood sugar is independent of the age of people.

Alternative hypothesis: The level of blood sugar is dependent on the age of people.

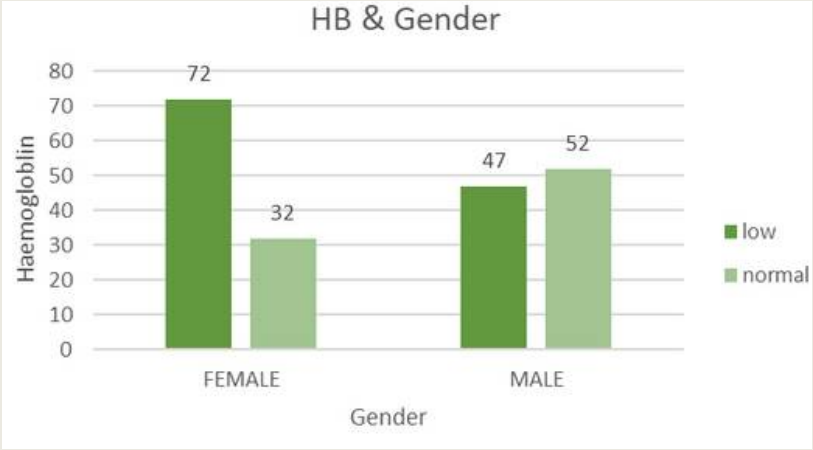
Through the chi-square test of association, we rejected our null hypothesis at a 5% level of significance which leads to the conclusion that blood sugar is dependent on the age of the people.
On observation, we found out that the age group of 40-60 usually has higher blood sugar as compared to the other age groups. Likewise, the test of independence between age and blood pressure and age and bone density was also rejected at a 5% level of significance which concluded that the blood pressure of people is also dependent on the age of the people and so is bone density. The 40-60 age group had a higher proportion of people with higher blood pressure and borderline osteoporosis.

Next, we analysed gender and health variables, taking Gender and haemoglobin
We set our hypothesis as:-

Null hypothesis: There is no relationship between haemoglobin and the gender of the people.

Alternative hypothesis: There exists a relationship between haemoglobin and the gender of the people.

Our null hypothesis got rejected (p-value = 0.001655613) at a 5% level of significance indicating the existence of a relationship between gender and haemoglobin on further applying the z-test of proportions we found out that females have a significantly more significant proportion at 69% compared to males at 41% who have low haemoglobin.



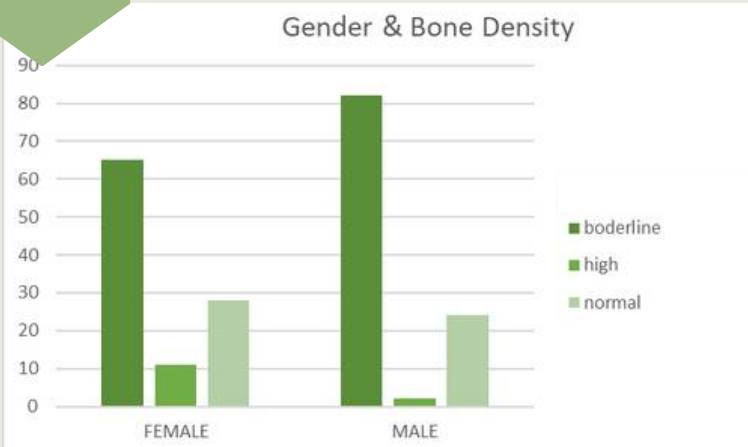
Similarly, we also did a chi-square independence test on gender and blood pressure and rejected the null hypothesis at a 10% level of significance, indicating the existence of a relationship between gender and blood pressure, on further testing we also found out that males have a higher proportion of high blood pressure as compared to females.

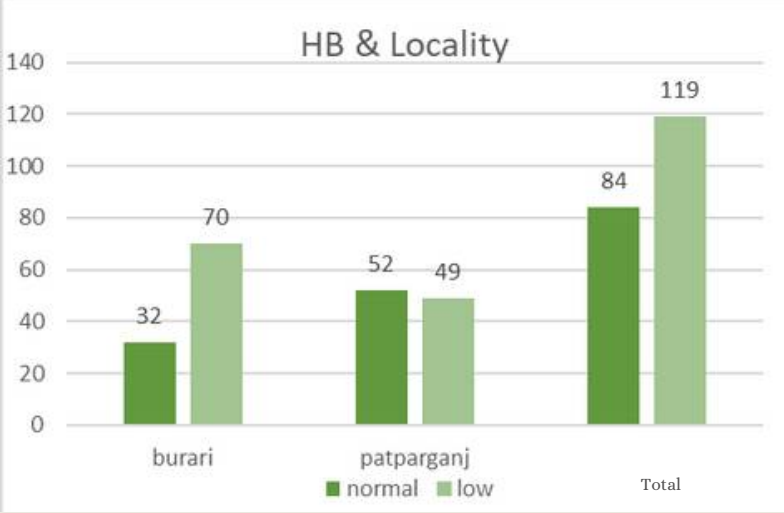
To test the relationship between bone density and gender we set our hypothesis as follows:-

Null hypothesis: Gender and bone density are independent of each other.

Alternative hypothesis: Gender and bone density are dependent on each other.

On applying the chi-square test of association we rejected our null hypothesis at a 5% level of significance which implies that there exists a dependent relationship between gender and bone density of the people, further we also applies tests of proportion to figure out the difference in means through which we found





Comparative Analysis between the four localities: Burari, Patparganj, Mayur Vihar, and Shastri Nagar.

out that 62% of females and 75 % of males have borderline osteoporosis.

Haemoglobin
To analyse the relationship between locality and haemoglobin we had data from 2 areas, Burari and Patparganj.

With the help of the chi-square test of association which got rejected at a 5% level of significance we found out there exists a relationship between localities and level of haemoglobin and to further find out if there is a difference in mean between the 2 localities we used proportion tests, the hypothesis was as follows :

Null hypothesis:
The proportion of low hemoglobin is the same in Burari as the proportion of low hemoglobin in Patparganj.

Alternative hypothesis:
Burari has a higher proportion of people with low hemoglobin than Patparganj.

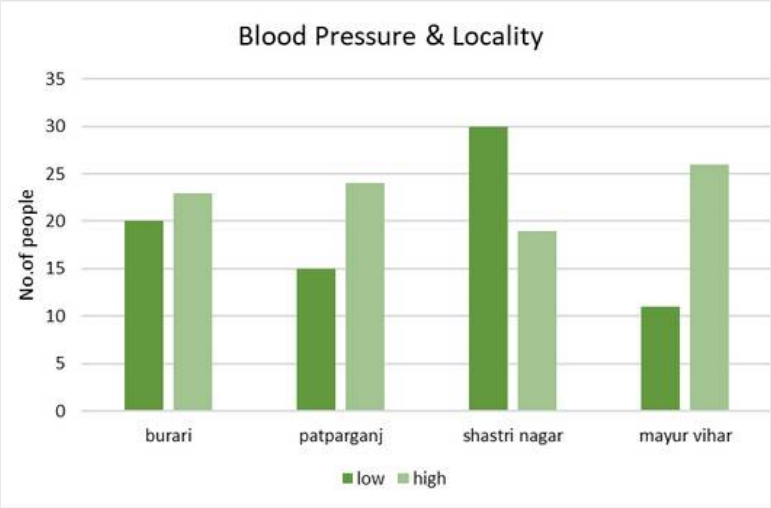
The calculated z statistic was more significant than our p-value therefore we reject our null hypothesis at a 5% level of significance (p = 0.003624303), which leads to our conclusion that Burari has a higher proportion of people with low hemoglobin at 68.6% as compared to Patparganj at 48%.

Blood pressure
To study the relationship between locality and blood pressure we applied the chi-square test of independence and found that the calculated p-value was less than a 5% level of significance hence our null hypothesis was rejected, implying that the 2 variables are dependent on each other.
To further figure out the difference of means we used the z-test to figure out which locality had the highest proportion of people with low blood pressure.

Null hypothesis:
The proportion of low blood pressure is the same in Shastri Nagar as the proportion of low blood pressure in Patparganj.

Alternative Hypothesis:
The proportion of low blood pressure is higher in Shastri Nagar as compared to the proportion of low blood pressure in Patparganj.

As the value of z statistics is greater than the p-value we conclude that the Proportion of low blood pressure is higher in Shastri Nagar as compared to the proportion of low blood pressure in Patparganj.
Similarly, we also found out that between Shastri Nagar and Mayur vihar, Shastri Nagar had a higher proportion of people with low blood pressure, and between Burari and Mayur Vihar Burari had a higher proportion, these tests also suggest that Burari had a higher proportion than Patparganj.



Though when we compared the high blood pressure of these localities there was not much difference found between them, almost all the localities had a similar proportion of high blood pressure.

Blood sugar

To study the relationship between locality and Blood Sugar we applied the chi-square test of independence and found out that the calculated p-value was less than a 5% level of significance hence our null hypothesis was rejected implying that the 2 variables are dependent on each other.

To further figure out the difference of means we used the z-test to figure out which locality had the highest proportion of people with high Blood Sugar.

Null hypothesis: The proportion of high Blood Sugar is the same in Mayur Vihar as the proportion of High Blood Sugar in Burari.

Alternative Hypothesis: The proportion of high Blood Sugar is higher in Mayur Vihar as compared to the proportion of High Blood Sugar in Burari.

As the value of z statistics is greater than the p-value we conclude that the Proportion of low blood pressure is higher in Mayur Vihar as compared to the proportion of low blood pressure in Burari.

Similarly, we also found out that between Shastri Nagar and Mayur vihar had a higher proportion of people with high Blood Sugar and between Patparganj and Mayur Vihar, Mayur vihar had a higher proportion, these tests also suggest that Burari had a lower proportion than Patparganj.

This proportion of people with high blood pressure was comparatively less in the whole data as there were a large number of proportions of people with normal blood sugar.

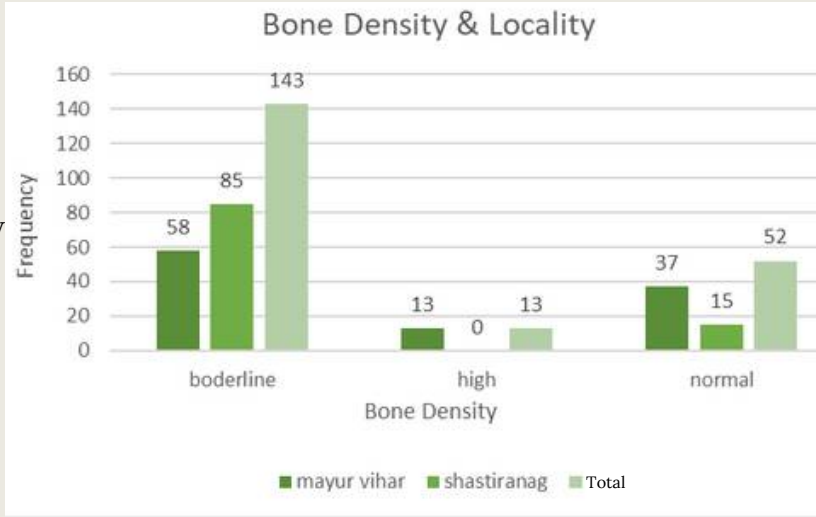
Bone density

To analyse the relationship between locality and Bone Density we had data from 2 areas, Mayur Vihar and Shastri Nagar. With the help of the chi-square test of association which got rejected at a 5% level of significance we found out there exists a relationship between localities and level of Bone Density and to further find out if there is difference of mean between the 2 localities we used proportion tests, the hypothesis was as follows:

Null hypothesis: The proportion of Borderline Bone Density is the same in Mayur Vihar as in the Borderline Bone density in Shastri Nagar.

Alternative hypothesis: Shastri Nagar has a higher proportion of people with Borderline Bone density as compared to Mayur Vihar.

The calculated z statistic was greater than our p-value therefore we reject our null hypothesis at a 5% level of significance (p = 1.27952E-06) which led to our conclusion that Shastri Nagar has a higher proportion of people with Borderline Bone density at 85% as compared to Mayur Vihar at 53.7%.



Results

People belonging to the higher income group had higher blood pressure as compared to the lower income group.

The lower income group had a larger proportion of people 83% who have borderline osteoporosis.

The age group of 40-60 usually has higher blood sugar as compared to the other age groups. This age group had a higher proportion of people with higher blood pressure.

The 40-60 age group had a higher proportion of people with borderline osteoporosis,62% of females and 75 % of males have borderline osteoporosis.

The female population has a significantly larger proportion at 69% as compared to males at 41% who have low hemoglobin.

Between the Four

Burari has a higher proportion of people with low haemoglobin at 68.6% as compared to Patparganj at 48%.

The proportion of low blood pressure is highest in Shastri Nagar, then Buhari followed by Patparganj and Mayur Vihar.
There was not much difference found between the high blood pressure of these localities.

The proportion of High Blood Sugar is highest in Mayur Vihar, then Patparganj followed by Burari and Shastri Nagar.

The proportion of people with high blood sugar was comparatively less in the whole data as there were a large number of proportions of people with normal blood sugar.

Shastri Nagar has a higher proportion of people with Borderline Bone density at 85% as compared to Mayur Vihar at 53.7%

Limitations

The data collected is cross-sectional in nature. Therefore, some biasedness can be expected in the results obtained.

The cities taken for study are of Delhi only. So, the findings can be applied to only the localities of Delhi. One cannot expect the same results from cities all over India.

Conclusion

People who have borderline osteoporosis are recommended to eat foods that are rich in calcium and vitamin D is important. They are also advised to do regular weight-bearing exercises, such as weight training, walking, hiking, jogging, climbing stairs, tennis, and dancing.

Patients with high blood sugar are recommended to eat a healthy, reduced-fat, and low-salt diet, avoid excess alcohol, and exercise regularly.

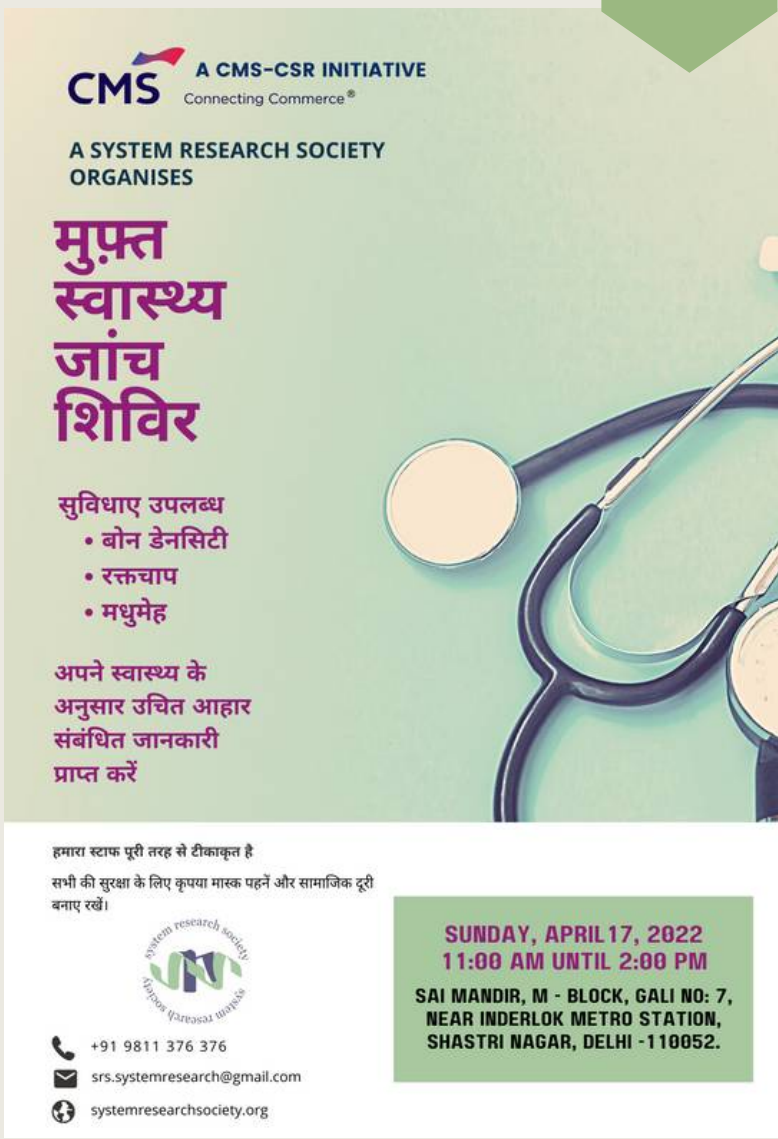
People with low haemoglobin are advised to change their diets and eat a vitamin-rich diet which included food that is rich in iron such as red meat, fish, leafy vegetables, nuts, dried berries, etc. As Burari had the highest proportion of people with low haemoglobin the people are advised to take the following measures in their regular diet.

People with low blood pressure are advised to drink more water and less alcohol, exercise regularly and eat small meals regularly. People of Shastri Nagar had the highest proportion of people with low blood pressure and therefore are advised to get checked with the nearest facility and take precautions.

Scope

The COVID-19 pandemic has had far-reaching consequences on the physical and mental health of individuals. Even after the situation has somewhat settled and people are getting used to the new normal, the immune system

Flyers were distributed in the localities 3 days before each camp. It was also shared as Facebook and Instagram posts by the organisation. The following was shared in English and Hindi for wider outreach. They were also kept at the local drug and chemist stores. All the volunteers and members of the organisation also shared the details of the event in their individual capacities.



of people is still weak and takes a hit when exposed to even slightly different conditions.
The results and conclusions will help in identifying the weaknesses and illnesses that are prominent in different cities of Delhi.
The organization plan to expand in the future and cover more cities and states, which will help in identifying the common factors affecting the health of people and ways to strengthen the health and immune system of people.

Camp site: Burari

The medical camp at Burari was held on March 13, 2022. Along with the medical tests, we also collected data to get an idea of the people's economic conditions. 102 people visited the camp out of which there were 68 women and 34 men, we found that 53.3% of the people that visited had completed their matriculation while only 11.2% of people had completed their SSLC. It was also observed that 67.6% of the women were housewives whereas 21.2% of women were working. 78.09% of the people had access to hospitals and clinics.

There were three tests that were conducted, which were blood sugar, blood pressure, and haemoglobin. From the data collected at Burari, we analysed that more than 71% of the women are found to have low a haemoglobin, a normal range for haemoglobin in women is supposed to lie between 12-15 grams per deciliter.

Burari had a comparatively large proportion of people with low blood sugar as compared to other localities

Camp site: Patparganj

The second medical camp which was held on March 20, 2022, at Patparganj witnessed a large-scale turnout of mid-segment people. out of the population of 101 people that visited there were 36 women and 65 men. From the data collected, we observed that 33.9% of the people had completed their undergraduate out of which 8% are women. 54% of the women that visited were housewives while 34% of the women are employed.

It was also noticed that 86.4% of the people do not avail of any government-related health scheme. We analyzed that more than 15% of the male population that got their checkup done had high blood sugar whereas females had comparatively normal blood sugar.

We also noticed that more than 42% of the people had low hemoglobin out of which about 30% was the male population. the normal range for men is 13-18 grams per deciliter. We also observe that the higher income group had a higher proportion of low hemoglobin as compared to lower income group.

Camp site: Mayur Vihar

The third medical camp was held on March 27, 2022, at Mayur Vihar, where along with the usual tests such as blood pressure, blood sugar, and bone density was also calculated. The test can identify osteoporosis, determine your risk for fractures (broken bones), and measure your response to osteoporosis treatment. It compares to that of an established norm or standard to give you a score known as T-Score.

On analyzing the t score of people it was found that more than half of the population that visited the camp had Osteopenia (low bone density) out of which 62% were male patients. According to WHO, the more negative the number, the weaker your bones and the more likely they are to break, the patients were also recommended a nutritious diet to improve their score.

It was observed that this locality had the highest proportion of people with low blood sugar. Considering the economic conditions from the data collected, only 11.5% of the people that visited were illiterate, 70.4% of the women that visited were housewives and 66.9% of the people did not avail of ration at subsidized rates.

Camp site: Shastri Nagar

The fourth medical camp was held on April 17, 2022, in Shastri Nagar where 104 people visited out of which 39 were women and 65 were men. In this locality, we also collected data on people's dietary choices, with the help of which we observed that people who are vegetarian have a higher proportion of people who had low blood pressure at 37% as compared to non-vegetarians at 24%.

Here also along with blood pressure and blood sugar, the test of bone density was also conducted in which we observed that Shastri Nagar has a higher proportion of people with Borderline Bone density at 85% as compared to Mayur Vihar at 53.7%.

Due to such a high proportion of people with osteopenia, people were recommended to improve their diet and were advised to get a follow-up checkup at the nearby hospital soon.

Our Actions Serve Humanity

SRS stands for System Research Society which advocates overcoming social and economic barriers, to help individuals reach their desired goals. Propelled by meaningful social interactions, it vouches to achieve sustainable change.

The Mission
Empowering mankind globally by creating awareness.

The Vision
Shaping the future for an equitable living, discovering means for a possible sustainable change, and sharing the knowledge with the world. Ultimately, the goal of the organization is to help usher in a more compassionate and equitable world for all.

The Organisation
System Research Society (SRS) is an organisation for uplifting lives. Through responsible promotion and by creating ripples of awareness every individual is tried to be touched, through capacity building, research, publicity, publishing, and holding conferences and seminars to derive sustainable change. It envisions creating an alternative paradigm that ensures individual welfare, sustainable economic growth, and consequential social prosperity. At SRS, empowerment is driven through awareness.

The Work
SRS stimulates collective participation as a tool to propound causes of global concern. SRS inspires solidarity in the community to serve humanity by collating individual skills, time, and resources to bring about sustainable change. It initiates and inspires the youth to become leaders and agents of change through grassroots public service opportunities.

To meet its mission of empowerment, SRS makes living, sharing, and working in everyday life, an experience to foster the development of service, and learning opportunities, becoming a focal point of change.

Along with spreading awareness and capacity building, the organisation feeds the hungry from its soup kitchens and food banks under its various food programmes; the weekly and the monthly food programmes, the relief support programme and the mid-day meal programme for the children of the economically not so privileged sections. Other than that the organisation takes care of orphans, and educates children, With the initiative around six lakh people are fed every year.

The Commitment
SRS is committed to establishing a platform that is humanitarian, and responsible, providing effective services and opportunities that account for development, and enhancement in quality of lives and experiences, and to tie the thread of humanity with compassion, mutual respect, and inclusivity.

Spread across India in Delhi, UP, Rajasthan, Telangana, Karnataka, Kerala, and Maharashtra, SRS on ground projects empower people at basic levels.

We're a community that believes that everyone deserves a quality life. We're reshaping the landscape of human life by creating awareness to empower them guided by our hundred percent promise of empowerment.

Our Approach

We build safe ecosystems, support individuals with innovative resources, and provide them with supportive programs in order to increase outcomes. As a data-driven organization, we rigorously monitor the effectiveness of every program, project, and pilot that we implement.

We value freedom, and real freedom requires an economy that works for everyone. Freedom means being able to make a living and have time for a lifetime to take a loved one to the doctor, attend a parent/teacher conference, spend time with family, and retire in dignity.

We, at SRS work to make sure that everyone gets a fair shake, so we all have the freedom to join together in a union and negotiate a fair life. In alignment with the principles of the organisation, many direct and indirect self-funded activities are carried out in seven states of this country.

Daily Food Programme

Around 3500 people are fed; nutritious, wholesome, freshly prepared meals prepared in our community kitchens. The daily food programme channelizes hygienic food, prepared under strict supervision, to those in need. The process manifests daily through our kitchens in Delhi, Hyderabad, Noida, Ajmer and Vishakhapatnam.

Mid-Day Meal Programme

Through the Mid-day meal program, we ensure that children, belonging to economically not-so-privileged backgrounds, attend school regularly. Every day a different menu is served.

Along with this, meritorious students are awarded financial aid in the form of scholarships.

Weekly Food Programme

Like all other initiatives, the weekly food programme is a people-centric initiative that serves food at certain identified locations. Through this people are given the required nourishment while they return to their homes after having toiled for the day. In NOIDA, Vishakhapatnam, Hyderabad, and Trivandrum regularly carry out this and similar programmes. We have been conducting rehabilitation camps in Telengana and Andhra Pradesh.

Monthly Support

As a core responsibility, fundamental support, both financial and foundational, is given to thirty-two orphans in Delhi and fifty orphans in Hyderabad. The idea is to strengthen their capabilities as individuals and is taken care of by SRS, by providing for their education expenses. Many families are also being supported on monthly basis.

Relief Support

During times of natural calamity or disaster, emergency relief camps have been supplied with food, water, and medical support at the site. Emergency Food Relief programmes have been effectively organized in time and with available resources to cater to on-ground needs.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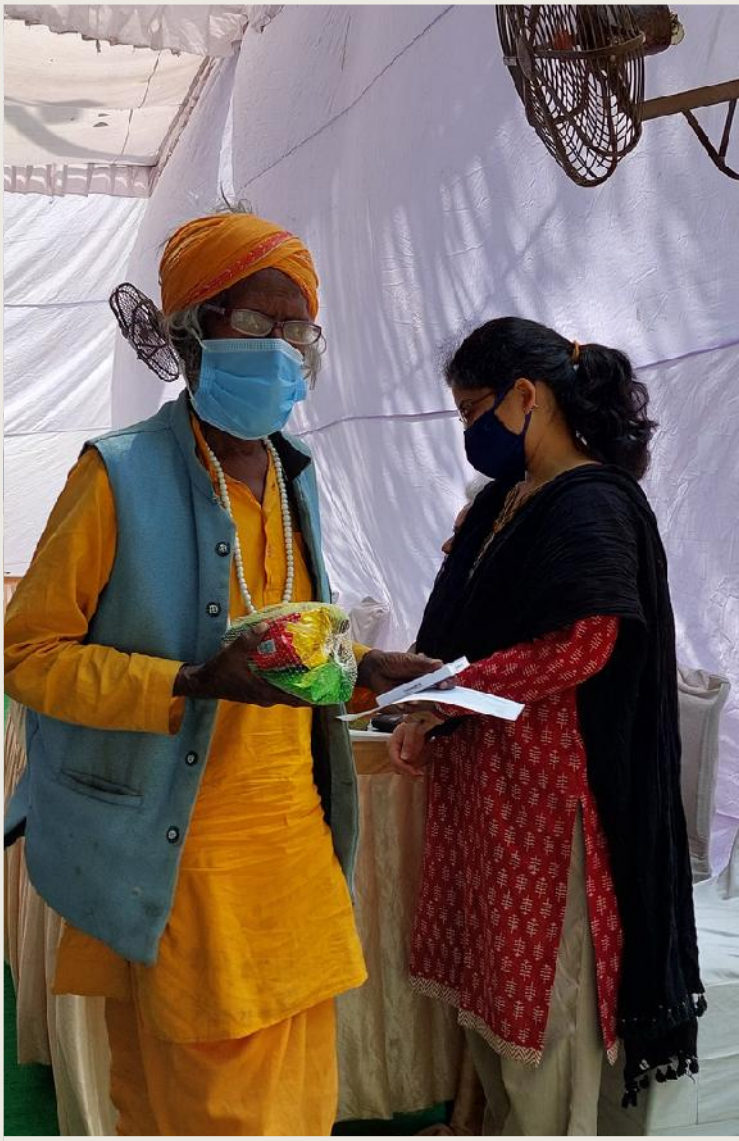

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System Research Society

C-101, Bathla Apartments,
43, IP Extension, Delhi - 110092
0 9811648191

srs.systemresearch@gmail.com
www.systemresearchsociety.org
https://www.facebook.com/systemresearchsociety.dywf.org