

No	Risk Factors	Score
1	Smoking/Tobaco consumption	1
2	Blood Pressure >140/90	3
3	Age > 60	1
4	Alcohol abuse > two drinks/day	1
5	Atrial fibrillation (irregular heart beats)	2
6	Diabetes- Random Blood sugar>160 OR HbA1C>6.5	2
7	Abnormal Lipid profile-cholesterol, LDL, HDL	2
8	Stress levels PSS level (0-4)	1
9	No Excercises	1
10	BMI >30	1
11	History of TIA	2
12	Sleep deprivation < 6 hrs	1
13	Air pollution: AQI >200	1
14	Family History of stroke, heart diseases	2
15	Other significant factor	
	TOTAL	21

Abnormal Lipid profile:

Cholesterol Levels >200

Tryglyceride levels > 180

LDL >100, or >70 in diabetic

HDL <60

Perceived Stress level questionare

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and stressed?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?

6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that happened that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

0 - never

1 - almost never

2 - sometimes

3 - fairly often

4 - very often

BMI:

Healthy Weight: BMI between 18.5 and 24.9.

Overweight: BMI between 25 and 29.9.

Obesity: BMI of 30 or greater.

Interpretation:

Total Score	Risk Category	Suggested Action
0–4	Low Risk	Maintain a healthy lifestyle and monitor periodically.
5–8	Moderate Risk	Lifestyle changes needed; consider a medical consultation.
9 and above	High Risk	High likelihood of stroke — needs medical attention , possibly further investigation and preventive treatment.

Recommended Risk Calculation Period for the Brainline Riskometer:

Brainline Riskometer is best positioned as a tool for **estimating short-to-medium-term risk** of developing a brain stroke — **within the next 5 years**, based on current risk factors.

Why 5 Years?

Most of the included factors (like hypertension, diabetes, atrial fibrillation, abnormal lipids) are dynamic — meaning they can improve or worsen with intervention or neglect.

A 5-year window provides actionable urgency but also realistic time for people to modify their risk through lifestyle and medical treatment.

Similar global tools like the Framingham Stroke Risk Profile use a 10-year risk model, but for community screening, 5 years is more intuitive and motivating.

FUTURE INCLUSIONS

1. GENETIC PROGNOSTICATION: this will be used later.

2. WC and WHtR (Waiste to height ratio)/BMI

a. Waist Circumference Is Often a Better Indicator than BMI:

Aspect	Waist Circumference	BMI
Stroke Risk	Strongly associated with stroke, especially ischemic stroke	Less specific for stroke risk
Fat Type	Reflects visceral (abdominal) fat , which drives metabolic and vascular dysfunction	Does not distinguish between fat and muscle
Regional Fat	Targets central obesity (a key driver of atherosclerosis, hypertension, insulin resistance)	Measures overall body weight relative to height
Predictive Power	More closely linked to hypertension, diabetes, and inflammation — all major stroke risk factors	May misclassify muscular individuals as “overweight” or ignore “normal-weight obesity”
WHO/IDF Guidelines	Waist circumference is a criterion in Metabolic Syndrome , which increases stroke risk	BMI alone is insufficient for metabolic risk prediction

Thresholds for Increased Stroke Risk (WHO/IDF):

- **Men:** >102 cm (40 inches)
- **Women:** >88 cm (35 inches)
- (Some Asian/Indian guidelines use lower cutoffs: >90 cm for men and >80 cm for women)

Evidence:

- Studies like the INTERSTROKE study have shown that **waist-to-hip ratio** is a stronger predictor of stroke than BMI.
- Central obesity is linked to a pro-inflammatory and pro-thrombotic state that predisposes to stroke, particularly **ischemic stroke**.

Between the two, **waist-to-height ratio (WHtR)** is generally considered a better and more consistent predictor of stroke and cardiovascular risk than waist circumference alone. Here's a comparison:

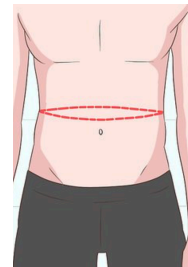
Waist Circumference vs. Waist-to-Height Ratio (WHtR)

Factor	Waist Circumference	Waist-to-Height Ratio (WHtR)
Measurement	Absolute waist size	Waist size relative to height
Population Use	Varies by ethnicity and gender	Works well across all populations (no need for gender- or ethnicity-specific cutoffs)
Predictive Power	Strong for central obesity & metabolic syndrome	Stronger predictor of stroke, heart disease, diabetes, and early mortality
Adjusts for Body Size	No (taller people may appear lower risk inaccurately)	Yes (accounts for overall body frame)
Stroke Risk	Associated with stroke risk	Better predictor of stroke risk than BMI or waist alone
Ideal Cutoff	Men >90 cm, Women >80 cm (in Asians)	WHtR > 0.5 = increased risk
Supported By	WHO, IDF	Endorsed by many researchers as a universal screening tool

Summary:

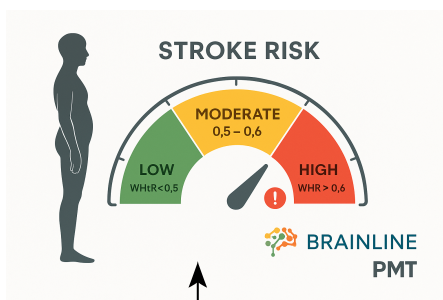
Waist-to-Height Ratio (WHtR) is:

- More accurate across populations
- Easier to remember (keep waist circumference < half of your height)
- More sensitive to early metabolic risk
- Better suited for **stroke risk prediction**



WHtR = Waist (cm) ÷ Height (cm)

If WHtR > 0.5 → increased risk of stroke, diabetes, hypertension



Better diagramatic representation than a pie chart.

Air Quality Index (AQI) Parameters and Pollutants in Thane, Raigad, and Navi Mumbai (New Bombay)

CPCB AQI Pollutants and Health Categories

The **Central Pollution Control Board (CPCB)** of India defines a National Air Quality Index (NAQI) that converts complex air quality data into a single index value with simple categories. There are **six AQI categories** – *Good, Satisfactory, Moderately Polluted, Poor, Very Poor, and Severe* – determined by concentration ranges of pollutants and their likely health impacts. The AQI computation considers **eight key pollutants: PM₁₀, PM_{2.5}, NO₂, SO₂, CO, O₃, NH₃, and Pb (lead)**. For each pollutant, a sub-index is calculated based on its concentration, and the highest sub-index (the “dominant” pollutant) determines the overall AQI. According to CPCB’s framework, at least three pollutants (one of which must be PM_{2.5} or PM₁₀) are needed to report a valid AQI.

AQI Categories and Health Impact Statements: CPCB’s AQI categories are associated with health risk levels as follows:

- **Good (0–50 AQI):** Minimal impact on health.
- **Satisfactory (51–100):** May cause minor breathing discomfort to sensitive people (e.g. those with asthma).
- **Moderate (101–200):** Breathing discomfort to people with lung, asthma and heart diseases, children and older adults.
- **Poor (201–300):** Breathing discomfort to most people on prolonged exposure.
- **Very Poor (301–400):** Respiratory illness on prolonged exposure; affects people with existing diseases more seriously.
- **Severe (401–500):** Seriously impacts health even of healthy people; emergency conditions for those with existing illnesses.

Each pollutant has defined concentration “breakpoints” for the above categories (e.g. PM_{2.5} concentrations 0–30 µg/m³ = “Good,” 31–60 = “Satisfactory,” etc.).¹ Identify the Nearest Air Quality Monitoring Station

To calculate, use one of the following:

- **CPCB’s National AQI Portal:** <https://app.cpcbcr.com/>
- **SAFAR (System of Air Quality and Weather Forecasting And Research):** for cities like Mumbai, Pune, etc.
- **MPCB website:** Maharashtra Pollution Control Board publishes station-wise data.

- **Google Maps or mobile apps** like AQICN, AirVisual, or AQI India for location-based AQI.

2. Record Real-Time Pollutant Concentrations

From the nearest Continuous Ambient Air Quality Monitoring Station (CAAQMS), get hourly or 24-hour average concentrations for:

- **PM_{2.5}**
- **PM₁₀**
- **NO₂**
- **SO₂**
- **CO**
- **O₃**
- **NH₃**
- **Pb** (optional – rarely dominant)

You need at least three pollutants (one must be PM₁₀ or PM_{2.5}) to calculate AQI.

Most Dangerous for Brain (in India):

1. **PM_{2.5}** – Strongly linked to stroke, vascular dementia, neurodegeneration.
2. **Lead (Pb)** – Especially dangerous for children's brain development.
3. **NO₂** – Affects both cognition and stroke risk.
4. **Ozone (O₃)** – Exacerbates cognitive disorders in elderly and people with asthma.

Tools to Automate

- CPCB's Excel AQI Calculator
- Custom Google Sheets (I can build one for your Brainline camps)
- Use AQI APIs (e.g. IQAir, OpenWeatherMap) to pull area-specific AQI data
- Mobile apps for live readouts

For Rural or Semi-Urban Areas Without Monitors:

- Use **nearest town's station** within 15–25 km

- Cross-check with satellite-based sources like:
 - **NASA's Worldview**
 - **IQAir Map**

For Automation:

Option 1: Use Mobile Apps or Online Dashboards

You don't have to calculate AQI manually:

- **SAFAR-Air** (by IITM Pune): Gives real-time AQI for Mumbai and surrounding areas.
- **AQI India, IQAir, or AirVisual**: Location-based AQI from satellite and station data.
- CPCB AQI Portal: https://app.cpcbcr.com/AQI_India
- MPCB Dashboard: Maharashtra Pollution Control Board has station-wise data.

Use these apps to check AQI of the area 1–2 hours before your camp and record the value.





Option 2: Use Nearest Station Readings



In areas without a station:

1. Identify the nearest AQI station using a pin-drop tool or mobile app.
2. Assume that area's AQI is representative (within 5–10 km radius).
3. Display AQI on a board or printed card for camp awareness.

Option 3: Color-Coded AQI Cards (Pre-Printed)

Create and carry 6 laminated cards (Good to Severe) based on AQI range and health advisories:

Color	AQI Range	Health Message Example
 Green	0–50	Air is clean and safe
 Yellow	51–100	Minor discomfort to sensitive individuals
 Orange	101–200	Caution for those with heart/lung problems
 Red	201–300	Everyone should limit prolonged outdoor exertion

 Purple	301–400	High risk for sensitive groups
 Maroon	401–500	Emergency condition: avoid outdoor exposure

You can simply point to the card that matches the current AQI in that location.

To summarise:

Access Real-Time AQI Sources (India-Specific):

1. **CPCB National AQI Portal**

Shows station-wise AQI and dominant pollutants across India.

2. **SAFAR** (System of Air Quality Forecasting And Research)
Focuses on major Indian cities including Mumbai.

3. **Use Mobile Apps:**

- “SAFAR-Air” (official)
- “AQI India”
- “IQAir”
- “AirVisual”

4. **Google “AQI + [Location Name]”**
Often pulls data from CPCB or third-party APIs.

How to Use It at Your Camp:

- Check AQI 1–2 hours before the camp.
- Note down:
 - AQI value
 - Category (e.g. Moderate, Poor)
 - Dominant pollutant (e.g. PM_{2.5})