

4e. Demographic statistics related to Obstetrics

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Chapter goals

- Fix the **definitions and formulas** of obstetric-relevant demographic indicators.
- Know **primary Indian data sources** (SRS, NFHS, CRS) and how examiners expect you to quote them.
- Memorise the **latest national figures** (MMR, IMR, NMR, TFR, SRB, CBR/CDR, institutional delivery, C-section, anaemia, adolescent fertility) with sources.
- Interpret the numbers into **actionable obstetric meanings** (ANC coverage, risk stratification, programme priorities).

1) Why obstetricians must speak "demography"

Demographic indicators tell you how many women become pregnant, how many survive pregnancy, and how newborns fare. They guide ANC scheduling, facility preparedness, drug logistics (e.g., iron/calcium), and quality-improvement (e.g., LaQshya). India tracks these through the Sample Registration System (SRS), National Family Health Survey (NFHS) and Civil Registration System (CRS) under the Registrar General of India (RGI).

2) Core indicators — definitions + formulas

Indicator	Definition (denominator in bold)	Formula (× multiplier)	What it signals in Obstetrics
MMR - Maternal Mortality Ratio	Maternal deaths during pregnancy/within 42 days from causes related to pregnancy per live births	(Maternal deaths / live births) × 100,000	Safety of pregnancy & intrapartum care; programme performance
IMR - Infant Mortality Rate	Deaths <1 year per live births	(Infant deaths / live births) \times 1,000	Quality continuum across antenatal, intrapartum, postnatal and newborn care
NMR - Neonatal Mortality Rate	Deaths 0-27 days per live births	(Neonatal deaths / live births) \times 1,000	Birth & immediate newborn care quality
ENMR / LNMR	Early neonatal (0-6 d) / Late neonatal (7-27 d)	(EN/LN deaths / live births) × 1,000	Delivery room + day-1 care vs. week-2-4 care
U5MR	Deaths under 5 years per live births	(U5 deaths / live births) × 1,000	Broader child-survival context
SBR - Stillbirth Rate	Fetal deaths (≥28 w or ≥1,000 g) per total births	(Stillbirths / live births + stillbirths) × 1,000	Antenatal/intrapartum loss burden
PNMR - Perinatal Mortality Rate	Stillbirths + early neonatal deaths per total births	((SB + ENND)/ live + SB) × 1,000	Late ANC + intrapartum + first-week care
CBR/CDR	Crude Birth/Death per mid-year population	(Births or deaths / population) × 1,000	Population load on services
TFR	Avg. number of children a woman would have by end of reproductive span	Sum of age-specific fertility rates (15-49 y)	Long-term obstetric caseload
SRB - Sex Ratio at Birth	Female births per 1,000 male births	(Female births / Male births) × 1,000	Proxy for sex selection; social determinants
CPR/mCPR	(Modern) Contraceptive prevalence among married women 15-49 y	% using any/modern method	Demand satisfied; spacing/limiting success

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Quick example (show your steps in exams):

A district reports 12 maternal deaths and 18,500 live births in a year.

MMR = $12 / 18,500 \times 100,000 = 64.9 \approx 65$ per **100,000** (meets SDG target at district level).

3) Where the numbers come from (India)

- SRS (Sample Registration System): large, continuous survey; gives annual CBR, CDR, IMR/NMR, TFR and periodic MMR bulletins. Quote SRS for IMR/NMR/CBR/CDR and the latest MMR bulletin.
- NFHS-5 (2019-21): household survey; gives TFR, CPR/mCPR, institutional delivery, C-section rate, anaemia, adolescent fertility etc. Quote NFHS when fertility/coverage is asked.
- CRS: legal registration of births & deaths; completeness improving; used increasingly for state/district planning.

4) Latest India figures (memorise with source)

4.1 Mortality

- MMR (India, SRS 2020-22): 88 per 100,000 live births (decline from 130 in 2014-16).
- IMR (SRS 2023): 25 per 1,000 live births (from 26 in 2022). CBR 18.4, CDR 6.4 in 2023.
- NMR: 19 per 1,000 (SRS 2021; basis for trend; states vary).
- SDG targets: MMR <70 by 2030; NMR ≤12 and U5MR ≤25 by 2030. Quote SDG 3.1 & 3.2.

State contrasts you can cite (helps for viva):

• **Kerala IMR = 5** (SRS 2023, historic low); exemplar of high-quality MNCH continuum.

(If asked for newest MMR state ranks, quote the official SRS MMR bulletin for the relevant period—2020-22 nationally is current official; media reports for 2021-23 exist but cite with caution in exams.)

4.2 Fertility & sex ratio

- **TFR (NFHS-5): 2.0** children per woman (replacement ~2.1).
- SRB (NFHS-5): 929 females per 1,000 males (five years preceding survey).
- SRS 2023 highlights: CBR 18.4 indicates continued fertility decline; IMR 25 corroborates survival gains.

4.3 Service coverage & obstetric practice

- Institutional deliveries (NFHS-5): 88.6% nationally.
- Caesarean-section rate (NFHS-5): 21.5% overall; ~47% in private vs ~17% in public facilities (inequity alert).
- Anaemia (NFHS-5): 57% women 15-49 are anaemic; ~52% pregnant—programme priority.
- Adolescent fertility (NFHS-5): AFR 15-19 ≈ 43/1,000 (urban ~27; rural ~49).

5) Reading the numbers into clinical & public-health action

- MMR 88: India has crossed NHP-2017 goal (<100); to reach SDG 70, districts need targeted reduction of hypertensive disorders, haemorrhage, sepsis, anaemia, and delays (tri-delays model). Use PMSMA for risk triage and early referral.
- 2. IMR 25 / NMR 19: Most infant deaths are neonatal—focus on quality intrapartum care, immediate newborn care, KMC, early breastfeeding, infection prevention.

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- 3. **TFR 2.0 & CBR 18.4**: Ageing & shrinking cohorts will affect **labour rooms** unevenly across states; ensure **family planning counselling** in ANC/PNC to sustain replacement-level fertility where achieved.
- 4. **SRB 929**: Continue **sex-ratio surveillance** (RCH portal, PC-PNDT enforcement) and community interventions (BBBB).
- 5. **C-section 21.5% overall (private ~47%)**: Use **Robson classification** audits, second-opinion policies, VBAC counselling to reduce unnecessary CS while ensuring **timely** CS where indicated.
- 6. Anaemia 57%: Double down on IFA adherence, calcium separation, deworming (2nd trimester), and parenteral iron when needed; this is directly tied to PPH tolerance and MMR. (See ANC chapter for protocols.)
- 7. Adolescent fertility ~43/1,000: Strengthen School Health, RMNCH+A, menstrual health, delaying age at marriage, and contraceptive access to reduce LBW, preterm, anaemia, obstetric fistula risk.

6) How to present data-heavy answers

- Open with definitions + formulas.
- Quote source + period for each number: "India MMR = 88 (SRS 2020-22)", "IMR = 25, CBR 18.4, CDR 6.4 (SRS 2023)", "TFR = 2.0; SRB = 929 (NFHS-5)".
- **Interpret**: one line on what it means for obstetric practice (e.g., "High NMR means prioritise delivery room quality & day-1 care").
- Close with SDG targets to show direction.

7) High-yield tables

7.1 India at a glance (latest available; quote period)

Domain	Indicator	Value (India)	Period & Source
Maternal	MMR (per 100,000 live births)	88	SRS 2020-22
Newborn/Infant	NMR (per 1,000 live births)	19	SRS 2021
	IMR (per 1,000 live births)	25	SRS 2023
Fertility	TFR (children per woman)	2.0	NFHS-5 (2019-21)
Sex ratio	SRB (girls per 1,000 boys)	929	NFHS-5
Vital rates	CBR / CDR (per 1,000 pop.)	18.4 / 6.4	SRS 2023
Service use	Institutional delivery	88.6%	NFHS-5
Delivery mode	Caesarean rate	21.5% (Private ~47%)	NFHS-5
Nutrition	Anaemia, women 15-49 y	≈57%	NFHS-5

7.2 SDG alignment checkpoints (what to write)

- Target 3.1: reach MMR <70 by 2030 India is close (88) but must accelerate in high-burden states.
- Target 3.2: reach NMR ≤12 and U5MR ≤25 neonatal component remains the bottleneck.

8) Common pitfalls (and how to avoid in answers)

- Mixing up denominators: SBR/PNMR use total births; MMR/IMR/NMR use live births.
- Quoting "global" or media numbers without the Indian official source + year—always add "SRS 2023", "SRS 2020-22", or "NFHS-5".
- Using outdated TT/ANC schedules to explain trends—refer to Td, PMSMA, and DIPSI protocols from the ANC chapter.
- Over-interpreting one state—show at least one national and one exemplar state (e.g., Kerala IMR 5) if asked.

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Assessment

A) Short Answer Questions (5 marks each)

- 1. Define MMR, IMR, NMR, PNMR with denominators and multipliers; add one clinical implication each.
- 2. List **primary data sources** for obstetric demography in India and what each is best used for.
- 3. Write the latest national values for MMR, IMR, NMR, TFR, SRB, CBR/CDR with period and source.
- 4. State the **SDG 3.1 & 3.2 targets** and explain India's gap.
- 5. Explain how anaemia prevalence and C-section rates influence ANC and labour-room planning.

B) Long Answer Questions (10 marks)

- 1. "India's obstetric demography is improving but uneven." Discuss with definitions, latest SRS/NFHS values, SDG targets, and programme actions to close gaps (PMSMA, LaQshya, AMB). Add one district-level calculation example.
- 2. Critically appraise **C-section trends** (NFHS-5): national level, public-private split, and **Robson-based** strategies to reduce unnecessary CS without raising perinatal risk.

C) MCQs (single best answer)

1. Denominator of SBR is:

A) Live births B) **Total births** C) Pregnant population D) Women 15-49

Ans: B.

2. India's MMR according to SRS 2020-22 is:

A) 103 B) 97 C) **88** D) 70

Ans: C

3. IMR at all-India level in SRS 2023 is:

A) 27 B) **25** C) 19 D) 18

Ans: B.

4. **SRB** (NFHS-5) for India (girls per 1,000 boys):

A) 952 B) **929** C) 919 D) 907

Ans: B.

5. According to NFHS-5, the overall C-section rate in India is closest to:

A) 12% B) **22%** C) 32% D) 42%

Ans: B (≈21.5%).

References

Indian official sources

- SRS Special Bulletin on Maternal Mortality, 2020-22 (Office of the Registrar General & Census Commissioner, India): India MMR = 88.
- MoHFW / PIB note on SRS 2020-22 MMR (context & trend).
- SRS Statistical Report 2023 (RGI): IMR = 25, CBR 18.4, CDR 6.4.
- SRS Statistical Report 2021 / PIB: NMR ≈ 19 (trend reference).
- NFHS-5 (2019-21), National & Compendium Fact Sheets: TFR = 2.0, SRB = 929, Institutional delivery = 88.6%, C-section ≈ 21.5%, Anaemia ≈ 57% (women 15-49).
- How India counts births & deaths: CRS vs SRS (explainer).

Global targets

- WHO SDG 3.1 MMR <70 by 2030.
- WHO/UN SDG 3.2 NMR ≤12, U5MR ≤25 by 2030.

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30-second recap

- Learn the formulas/denominators cold.
- Quote source + period with each number: MMR 88 (SRS 2020-22); IMR 25; CBR 18.4; CDR 6.4 (SRS 2023);
 TFR 2.0; SRB 929; institutional delivery 88.6%; CS 21.5%; anaemia ~57% (NFHS-5).
- Map to **SDGs** and explain **what to do** in ANC/labour rooms (anaemia control, quality intrapartum & newborn care, rational CS, adolescent health).

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