4e. Demographic statistics related to Obstetrics

(e) Demographic Statistics Related to Obstetrics

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).

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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).

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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**) × **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**) × **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

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 × 100,000 = **64.9 ≈ 65 per 100,000** (meets SDG target at district level).

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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.

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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).

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

1. **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**.

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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.

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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.

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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.

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).