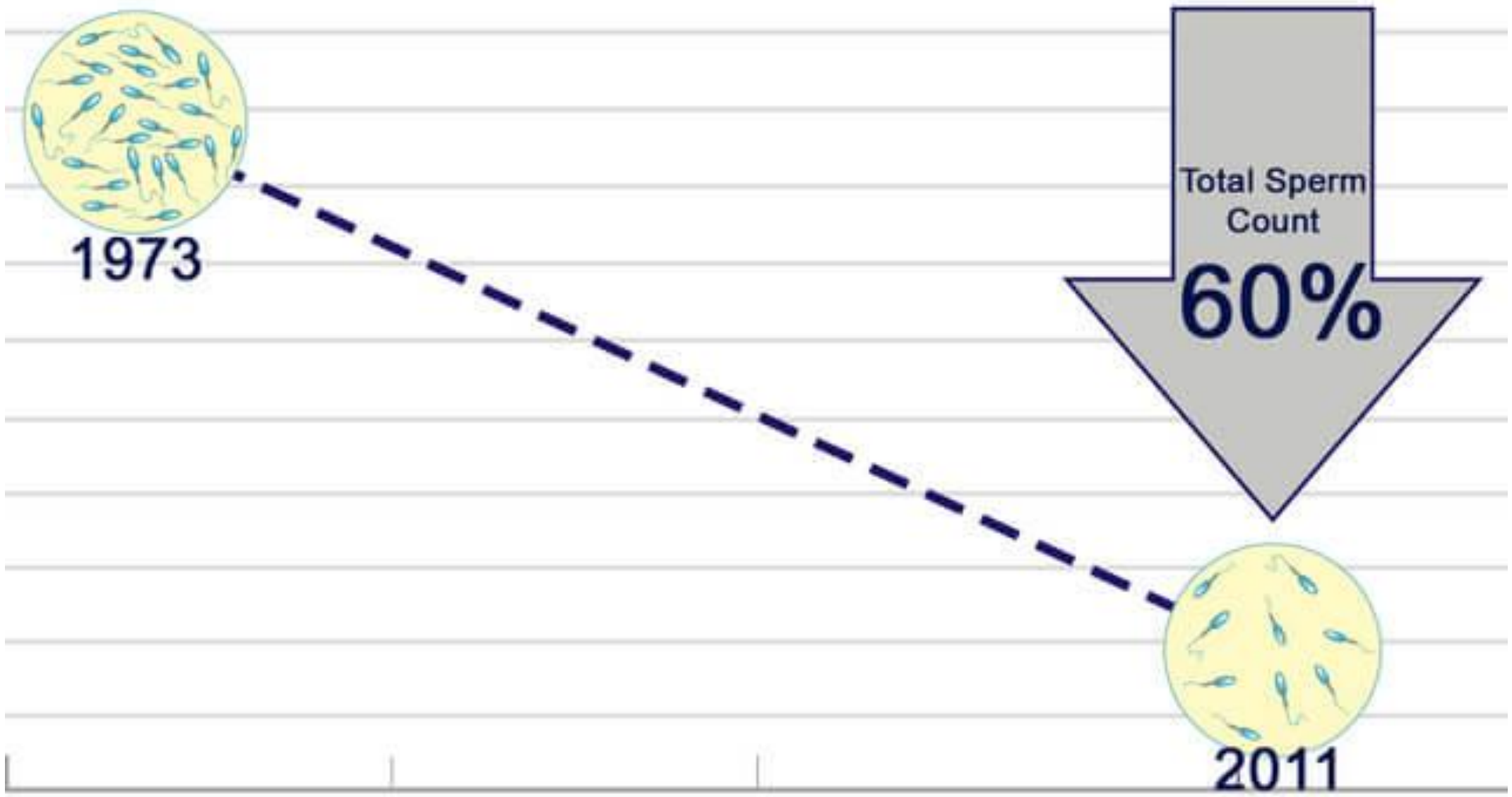
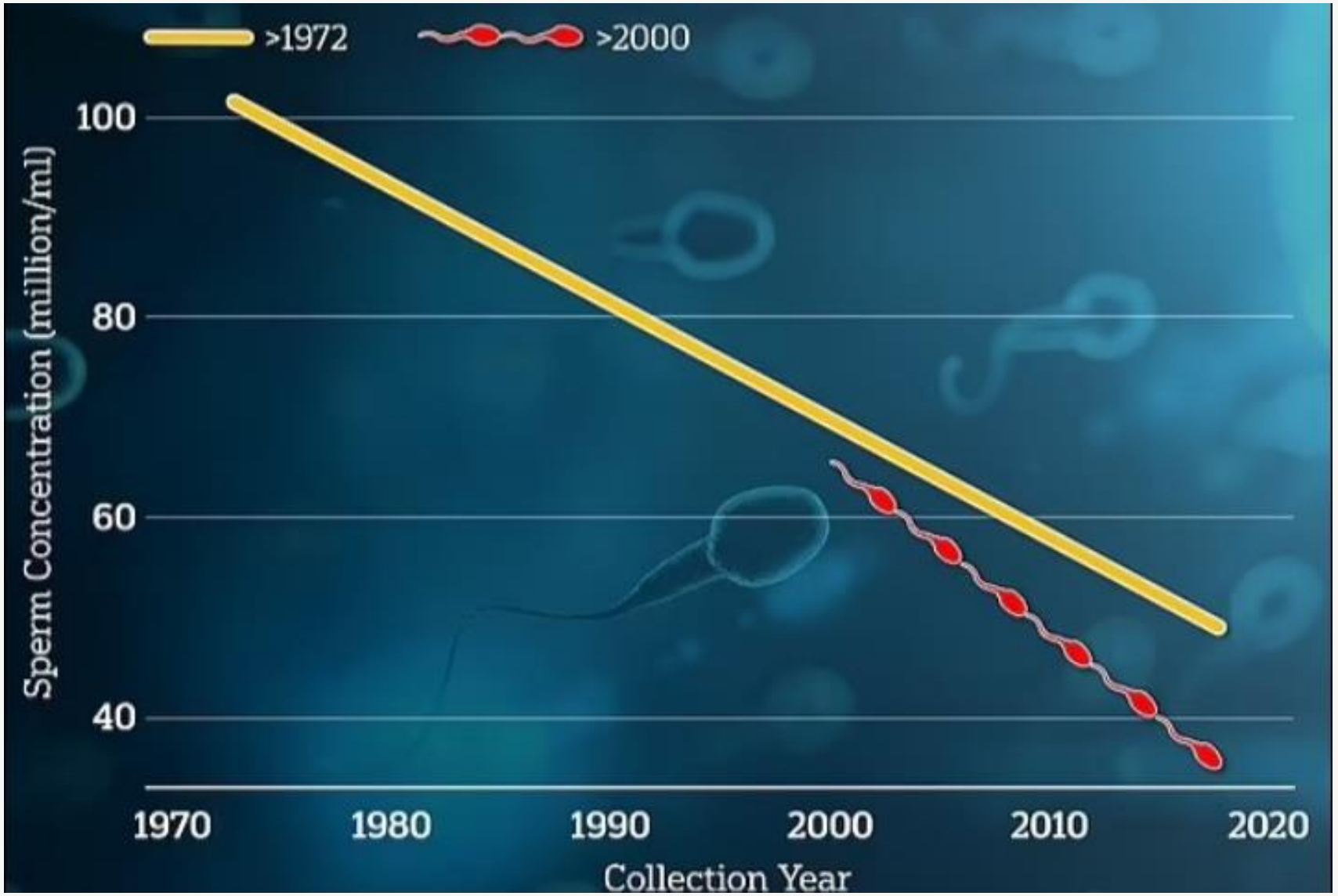
AN EXISTENTIAL THREAT

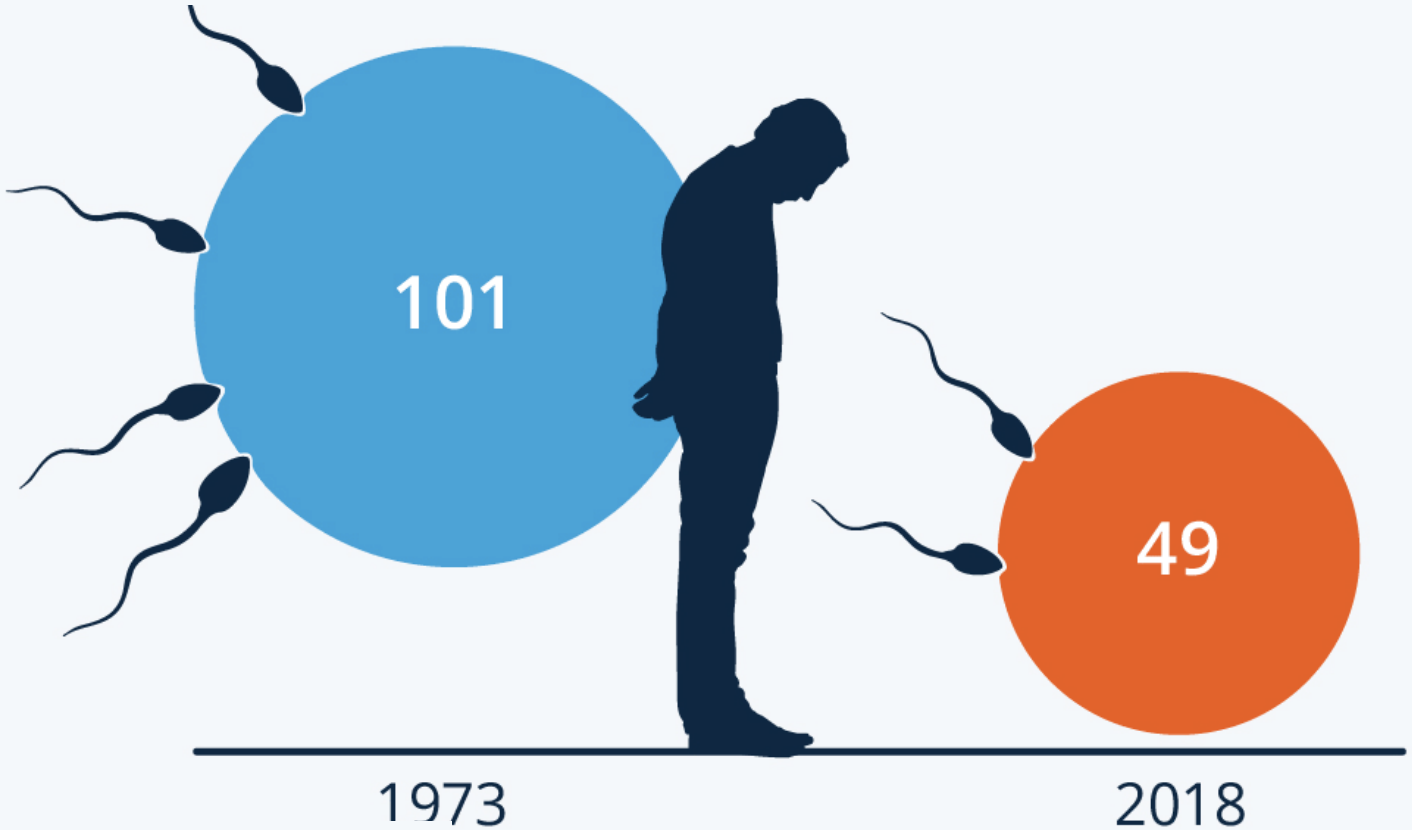

1973
Total Sperm Count
60%
2011

GLOBAL SPERM CONCENTRATION OVER TIME



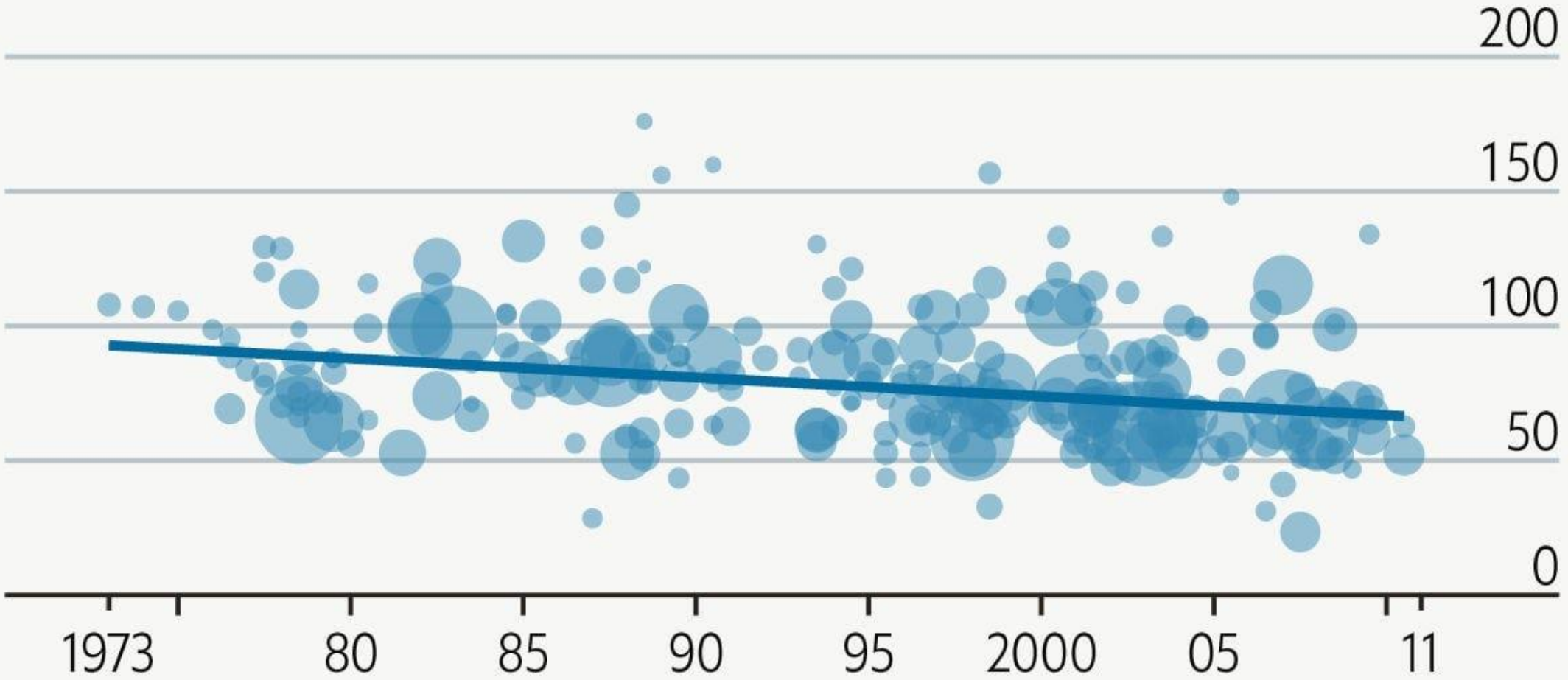
Fragile Fertility

Average sperm count of men worldwide in 1973 and 2018
(million sperm per milliliter of semen)



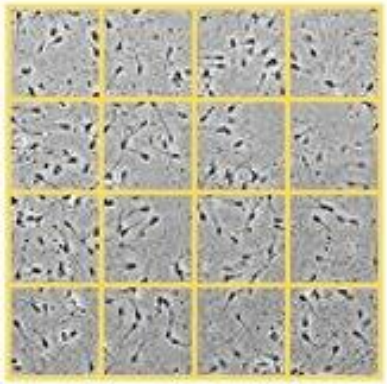
Source: Levine et al. Temporal trends in sperm count: a systematic review and meta-regression analysis. Human Reproduction Update (2022)

Average sperm concentration, million per millilitre

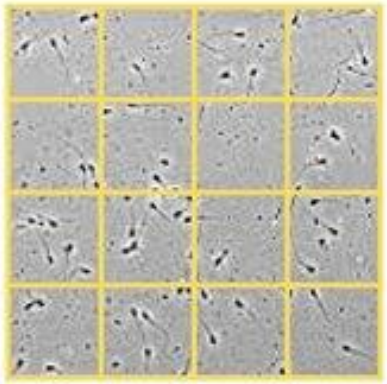


Source: Levine et al. Temporal trends in sperm count: a systematic review and meta-regression analysis. Human Reproduction Update (2022)

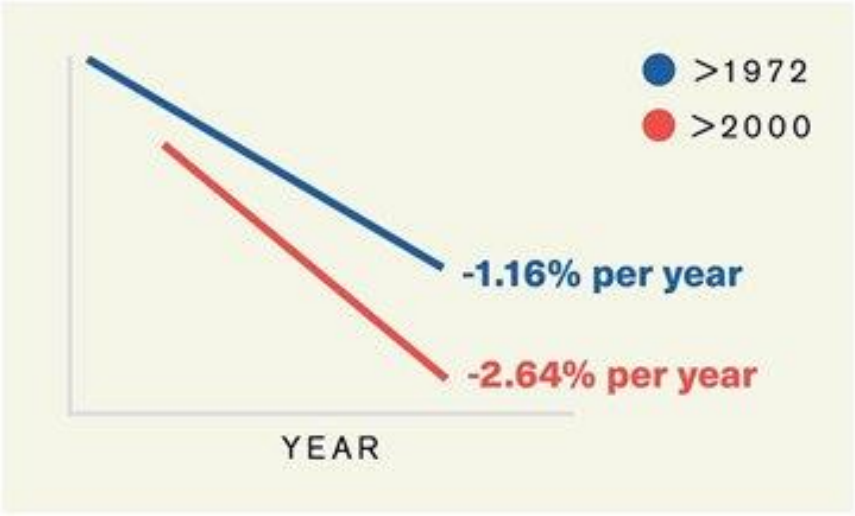
Sperm count is declining at an accelerated pace globally

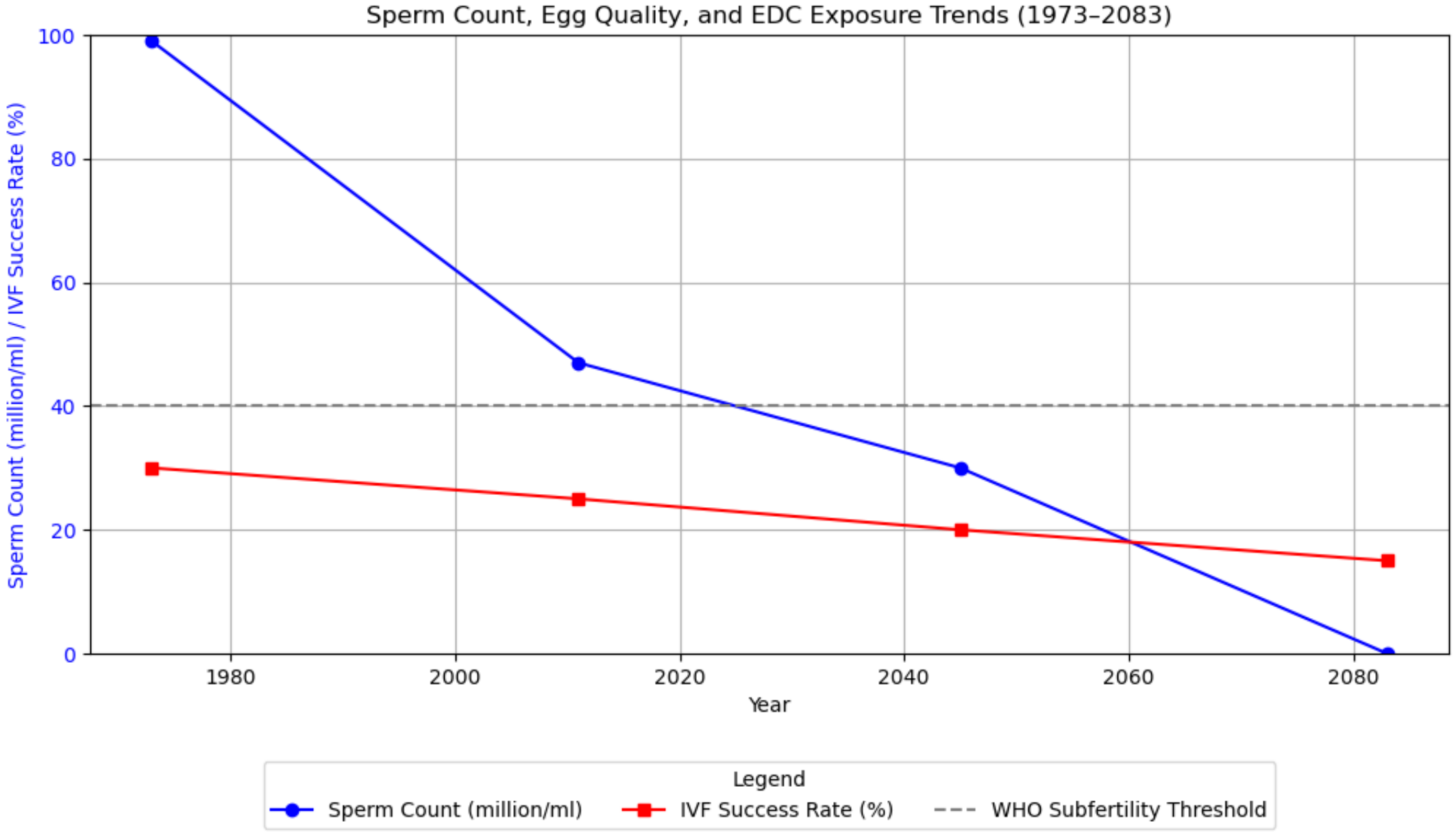


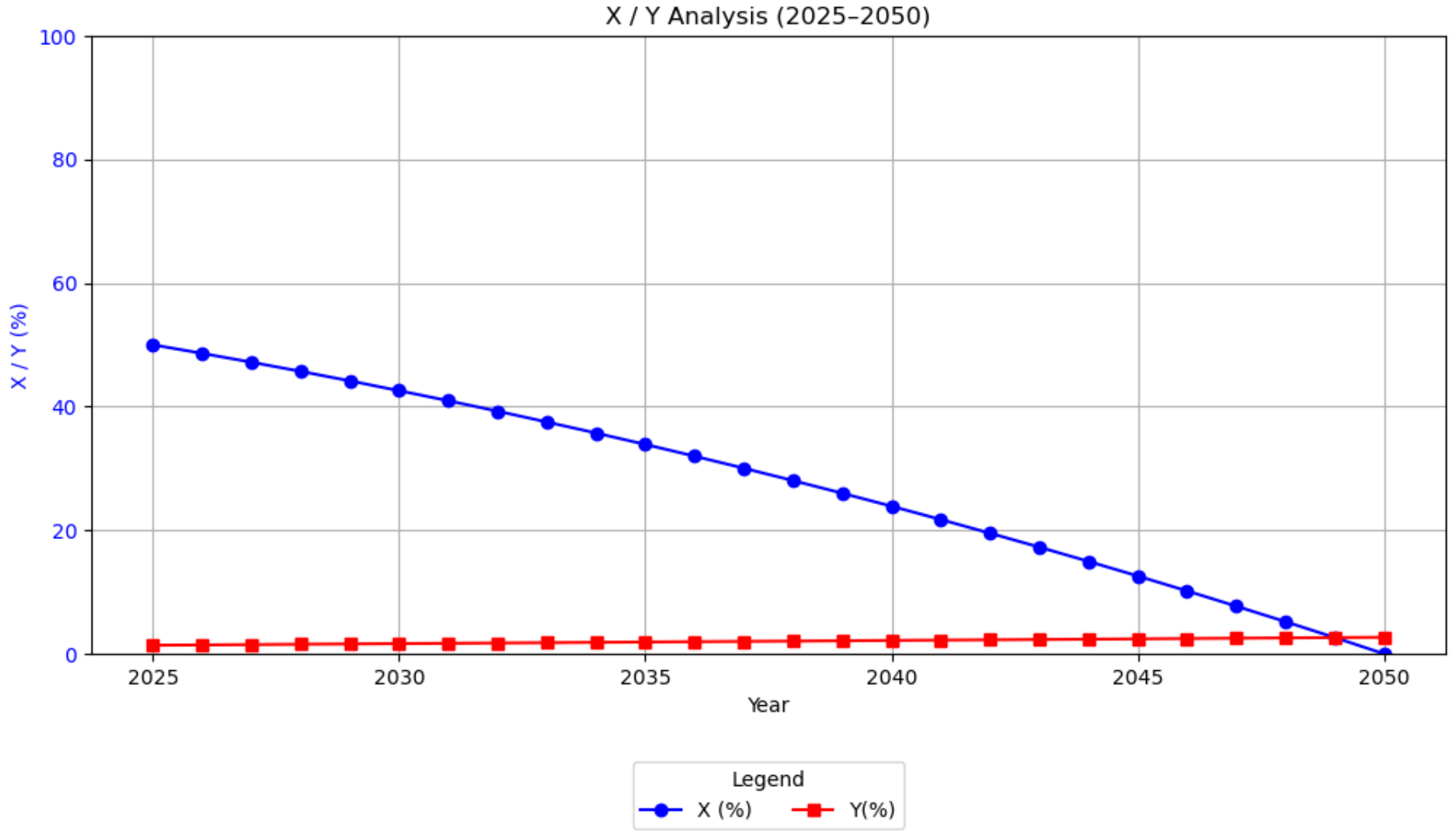
101 mill/ml
(1973)



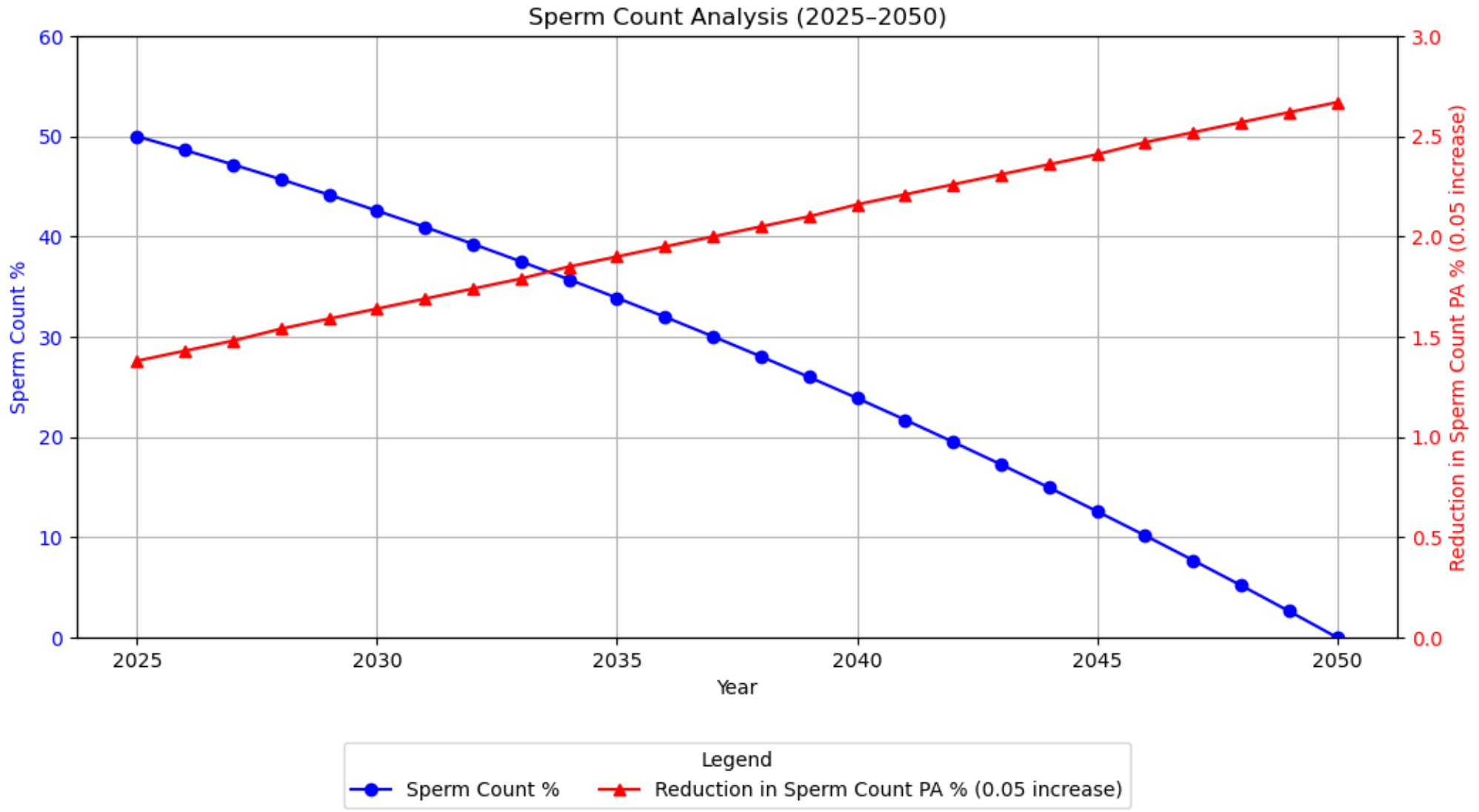
49 mill/ml
(2018)



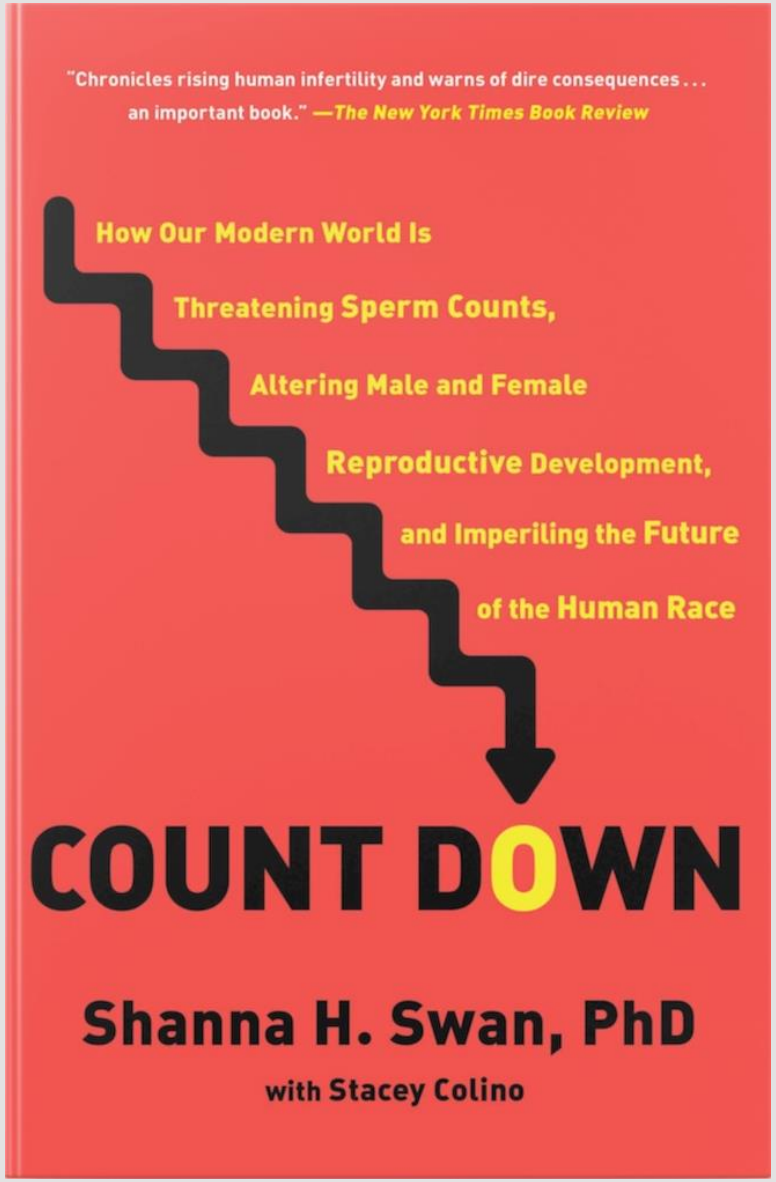

Sperm Count, Egg Quality, and EDC Exposure Trends (1973–2083)
Sperm Count (million/ml) / IVF Success Rate (%)
100
80
60
40
20
0
1980
2000
2020
2040
2060
2080
Year
Legend
Sperm Count (million/ml)
IVF Success Rate (%)
WHO Subfertility Threshold



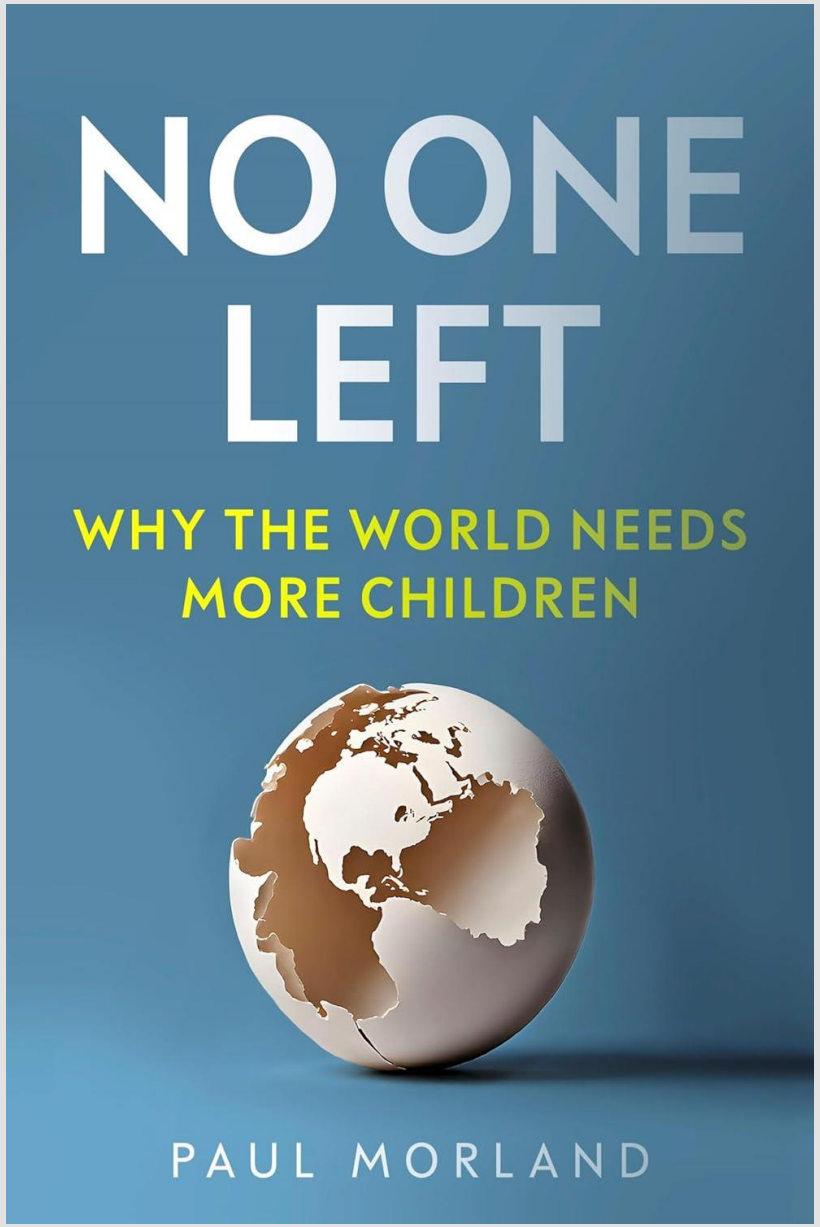
Guess what this graph represents?



This is what it represents!!



- Sperm counts in Western countries dropped by over 50% from 1973 to 2011, based on 185 studies involving nearly 45,000 men.
- Sperm count decline has accelerated to over 2% per year since 2000.
- Testosterone levels in men have decreased by 1% annually since 1982.
- Sperm quality (motility, morphology, concentration) has declined globally, including in South America, Asia, and Africa.
- The average 20-something woman today is less fertile than her grandmother was at 35.
- Miscarriage rates in the U.S. increased by 1% per year from 1990 to 2011.
- Male infertility contributes to one-third of all infertility cases, often unrecognised.
- Prenatal exposure to endocrine-disrupting chemicals (EDCs) like phthalates correlates with smaller testicular size and reduced sperm mobility in male infants.
- The secondary sex ratio (male-to-female births) is shifting due to environmental stressors, reducing male births.
- By 2045, if trends continue, many populations may face fertility rates too low to sustain current population levels.



- Global fertility rates have fallen below the 2.1 replacement level in many countries.
- South Korea’s population could decline by 85% in two generations due to low birth rates.
- Japan’s working-age population has shrunk by 10% since 2000.
- Europe’s fertility rate averages 1.5 children per woman, below replacement.
- By 2050, 23 countries may see populations halve without intervention.
- China’s population began declining in 2022, earlier than projected.
- Low fertility risks a 20-30% GDP reduction in affected economies by 2100.
- Immigration offsets only 10-15% of population decline in developed nations.
- Pension systems face collapse with a 3:1 retiree-to-worker ratio by 2050.
- Pro-natal policies in Hungary increased birth rates by 9% from 2010-2020.

DATA ON BIRTHS AND THE TOTAL FERTILITY RATE (TFR) 2025

	Births		Cha-	Mon-	TFR (Children per Woman)				
	2024	2025	nge	ths	2015	2020	2023	2024	2025
United States	1.462.305	1.461.364	-0,1	5	1,84	1,64	1,60	1,59	1,58
Canada	-	-	-	-	1,60	1,41	1,26	1,24	1,23
Australia					1,80	1,59	1,50	1,48	1,45
New Zealand	14.700	14.901	1,4	3	2,00	1,61	1,57	1,57	1,58
United Kingdom	-	-	-	-	1,77	1,51	1,43	1,41	1,36
Ireland					1,86	1,65	1,50	1,45	
Finland	14.456	14.506	0,3	4	1,65	1,37	1,26	1,25	1,25
Iceland	1.010	1.050	4,0	3	1,86	1,79	1,59	1,56	1,60
Norway	13.025	13.102	0,6	3	1,73	1,48	1,40	1,44	1,45
Sweden	33.175	32.179	-3,0	4	1,85	1,66	1,45	1,43	1,39
Denmark	13.810	14.144	2,4	3	1,71	1,67	1,50	1,47	1,49
Netherlands	67.427	66.892	-0,8	5	1,66	1,55	1,43	1,43	1,41
Belgium	36.318	35.707	-1,7	4	1,69	1,55	1,47	1,44	1,40
Luxembourg	-	-	-	-	1,47	1,37	1,25	1,25	
Germany	160.256	152.402	-4,9	3	1,50	1,53	1,39	1,35	1,29
Austria	18.816	18.006	-4,3	3	1,49	1,44	1,32	1,31	1,27
Switzerland	23.618	23.264	-1,5	4	1,54	1,46	1,33	1,29	1,27
France	273.600	263.200	-3,8	5	1,96	1,79	1,66	1,62	1,56
Italy	92.127	84.927	-7,8	3	1,33	1,24	1,20	1,18	1,11
Spain	102.898	103.884	1,0	4	1,33	1,18	1,12	1,12	1,13
Portugal	26.768	27.280	1,9	4	1,31	1,41	1,44	1,41	1,43
Greece	33.746	31.763	-5,9	6	1,33	1,39	1,26	1,24	1,19
Cyprus	-	-	-	-	1,32	1,36	1,40	1,30	
Malta	-	-	-	-	1,37	1,13	1,06	1,00	
Estonia	4.121	3.718	-9,8	5	1,58	1,58	1,31	1,18	1,08
Latvia	4.215	3.732	-11,5	4	1,71	1,55	1,36	1,24	1,12
Lithuania	7.780	6.783	-12,8	5	1,63	1,36	1,18	1,14	1,01
Poland°	86.000	77.000	-10,5	4	1,44	1,45	1,16	1,11	1,02
Czechia	20.299	18.095	-10,9	3	1,57	1,71	1,45	1,37	1,26
Slovakia	15.353	13.590	-11,5	4	1,40	1,59	1,49	1,46	1,34
Hungary	31.881	29.018	-9,0	5	1,44	1,56	1,51	1,39	1,28
Slovenia	5.257	5.263	0,1	4	1,57	1,59	1,51	1,50	1,52
Romania°°	47.233	43.723	-7,4	4	1,48	1,70	1,40	1,37	1,29
Moldova	5.008	5.462	9,1	3	1,87	1,76	1,61	1,66	1,90
Bulgaria°°	11.772	11.082	-5,9	3	1,59	1,69	1,60	1,62	1,57
Croatia	13.072	12.665	-3,1	5	1,42	1,56	1,47	1,48	1,47
Serbia°	24.114	22.351	-7,3	5	1,61	1,59	1,61	1,63	1,54
Montenegro	2.241	2.139	-4,6	4	1,73	1,75	1,76	1,75	1,67
Bosnia & Herzeg.°	5.520	5.225	-5,3	3	1,48	1,53	1,59	1,60	1,55
North Macedonia	4.925	4.735	-3,9	4	1,89	1,65	1,49	1,41	1,39
Albania	5.056	4.662	-7,8	3	1,80	1,73	1,62	1,63	1,54
Kosovo	6.638	6.719	1,2	4	2,20	1,90	1,91	1,92	1,96
Ukraine°					1,63	1,22	1,00	0,90	
Belarus°	-	-	-	-	1,93	1,55	1,34	1,25	
Russia	500.934	475.500	-5,1	5	1,78	1,51	1,41	1,40	1,37
UK: *England**	-	-	-3,4	5	*1,79*	*1,53*	*1,44*	*1,42*	*1,36*
Northern Ireland	*8.337*	*7.968*	*-4,4*	*5*	*1,94*	*1,68*	*1,64*	*1,61*	*1,54*
Scotland	*19.259*	*18.501*	*-3,9*	*5*	*1,59*	*1,34*	*1,30*	*1,29*	*1,24*
CA: *British Columbia*	*10.404*	*10.533*	*1,2*	*3*	*1,38*	*1,18*	*1,00*	*1,01*	*1,00*
Quebec	*18.600*	*18.550*	*-0,3*	*3*	*1,67*	*1,51*	*1,38*	*1,33*	*1,31*

	Births		Cha-	Mon-	TFR (Children per Woman)				
	2024	2025	nge	ths	2015	2020	2023	2024	2025
Jamaica°	-	-	-	-	2,10	1,94			
Puerto Rico	7.257	6.838	-5,8	5	1,34	0,92	0,89	0,87	0,84
Cuba	-	-	-	-	1,83	1,66	1,54	1,30	
Dominican Rep.	-	-	-	-	2,47	1,82	2,09	1,95	
Mexico	-	-	-	-	2,11	1,69	1,55	1,45	
Guatemala					2,87	2,26	2,17	1,84	
Nicaragua	-	-	-	-	2,55	2,13	1,79		
Costa Rica	14.774	14.481	-2,0	4	1,76	1,41	1,19	1,12	1,10
Panama					2,45	2,14	1,85	1,74	
Venezuela	-	-	-	-	2,35	2,23	2,01		
Colombia					1,94	1,73	1,40	1,23	
Ecuador	-	-	-	-	2,36	1,97	1,77	1,60	
Peru	-	-	-	-	2,39	2,00	1,76		
Chile	35.836	36.984	3,2	3	1,78	1,30	1,16	1,03	1,07
Argentina	-	-	-	-	2,24	1,54	1,33	1,24	1,14
Uruguay	-	-	-	-	1,96	1,42	1,25	1,19	
Brazil**					1,80	1,62	1,57	1,47	
Algeria	-	-	-	-	3,12	2,93	2,72		
Tunisia	-	-	-	-	2,40	1,96	1,55		
Egypt	494.000	454.700	-8,0	3	3,75	2,88	2,54	2,42	2,21
Palestine	-	-	-	-	3,74	3,36	3,23		
Jordan	-	-	-	-	2,96	2,44	2,45		
Iraq	-	-	-	-	3,83	3,05	2,91		
Israel	57.977	57.684	-0,5	4	3,09	2,90	2,85	2,87	2,83
Georgia					2,30	1,97	1,70	1,67	
Armenia	10.547	9.729	-7,8	4	1,64	1,66	1,88	1,75	1,65
Azerbaijan°	33.575	31.462	-6,3	4	2,30	1,89	1,83	1,69	1,62
Turkey	-	-	-	-	2,16	1,76	1,51	1,48	1,40
Kazakhstan	155.143	133.562	-13,9	5	2,73	3,13	2,96	2,80	2,42
Uzbekistan	347.415	333.352	-4,0	5	2,49	2,90	3,45	3,35	3,24
Kyrgyzstan°	46.273	43.026	-7,0	4	3,99	3,97	3,60	3,46	3,22
Tajikistan°					3,91	3,83	3,65	3,83	
Iran	259.398	245.678	-5,3	3	2,16	1,68	1,64	1,56	1,51
India	-	-	-	-	2,27	2,00			
Bangladesh	-	-	-	-	2,30	2,30	2,24		
Sri Lanka					2,11	1,92	1,62	1,45	
Mongolia	24.200	22.600	-6,6	5	3,01	2,94	2,71	2,48	2,36
Japan	230.014	220.261	-4,2	4	1,45	1,33	1,20	1,16	1,13
South Korea	79.627	85.739	7,7	4	1,24	0,84	0,72	0,75	0,81
Taiwan	53.434	46.407	-13,2	5	1,18	0,99	0,86	0,88	0,78
China	-	-	-	-	1,75	1,28	1,02	1,10	
Hong Kong	11.682	11.320	-3,1	4	1,20	0,88	0,75	0,84	0,84
Macao	1.155	1.006	-12,9	4	1,14	0,84	0,59	0,58	0,52
Vietnam	-	-	-	-	2,10	2,12	1,96	1,91	
Thailand	221.933	201.175	-9,4	6	1,54	1,21	1,05	0,95	0,87
Malaysia	106.386	93.500	-12,1	3	2,05	1,80	1,73	1,60	1,40
Singapore	8.122	7.693	-5,3	3	1,24	1,10	0,97	0,97	0,93
Philippines**					2,77	1,96	1,78	1,55	
Mauritius					1,36	1,45	1,39	1,40	

@BirthGauge

Values in grey are based on developments in some subnational regions and are less reliable
Chng: Percentage change compared to the same period one year earlier
2024 and 2025 data refer to the same period within the year

° Corrected for unaccounted emigration
°° Corrected for births happened outside of the country
* Estimate based on rolling 12-month figures
**Projection based on registered births and possible later registrations

11 12 1

Toxins in food processing, storage & preparation

Toxic EMF ‘pollution’ & 5G exposure

Past, present or chronic medical conditions

10 Toxic chemicals in livestock food production

Psychological stressors 2

9 Toxic chemicals in agriculture & farming

Toxins in home & work environments 3

8 Contaminants in drinking water

Toxins in personal care products 4

Toxins in the air & environment

Pharmaceutical & medical interventions

Unhealthy lifestyle choices

7 6 5

1

Past, present or chronic medical conditions (infections, illness)

- STIs can affect the reproductive system
- Kidney disease / failure
- Cancer
- Varicocele
- Microbiota: dysbiosis in gut, genital tracts
- PCOS, Endometriosis
- Acid-alkaline imbalance (pH)
- Dental infections and/or interventions (e.g. periodontal disease, mercury fillings)
- Anogenital Distance

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11 12 1

Toxins in food processing, storage & preparation

Toxic EMF 'pollution' & 5G exposure

Past, present or chronic medical conditions

10 Toxic chemicals in livestock food production

Psychological stressors 2

9 Toxic chemicals in agriculture & farming

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8 Contaminants in drinking water

Toxins in personal care products 4

Toxins in the air & environment

Pharmaceutical & medical interventions

Unhealthy lifestyle choices

7 6 5

2

Psychological stressors

- Stress and trauma related to infertility, previous pregnancy, miscarriage, stillbirth, SIDS *(*inability to conceive, IVF, miscarriages, birth trauma – own birth and / or trauma from previous pregnancies / deliveries)
- Partner status / relational (e.g. congruent ‘partner intention’, broken relationships, divorce, loneliness)
- Personal / inner conflicts (based on age, cultural or religious expectations) and professional pressures (prioritising work goals over having a family)
- Fear, anxiety, lack of safely and security (exacerbated by news, social media, future uncertainty, etc.)
- Economic / financial factors (job security, can we afford the costs of child-rearing?)
- Societal policies / factors including support (e.g. access to services or community)

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Unhealthy lifestyle choices

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3

Toxins in home & work environments

- Synthetic chemicals including ‘fragrance’ used in cleaning and laundry products, dry-cleaning
- Synthetic fragrance in scented candles, room deodorisers, paraffin candles
- Furnishings, fabrics & fittings – Teflon, flame retardants, water / stain repellents, ‘outgassing’ VOCs, etc.
- Air-conditioning (can disperse mould, bacteria, toxins in recirculating air)
- Office (e.g. photocopiers) and industrial chemicals
- Indoor emissions (e.g. gas, heating and cooking fuels / smoke, cabin air in planes, car exhaust, pesticides)

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Toxins in personal care products

The skin is the largest organ of the body.
Don't put anything on your skin that you would not eat!

- Toxic synthetic chemicals and dyes in make-up
- Synthetic chemicals including 'fragrance' in deodorant, talc, soaps, shampoo, shave foam, lubricants
- Synthetic perfume and colognes
- Hand sanitiser – 70+% alcohol (overuse can lead to liver damage), triclosan
- Hair dye / colouring chemicals
- Toxins under the skin (e.g. tattoos, Botox)

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Unhealthy lifestyle choices

- Obesity, carrying excess weight (increasing BMI linked to decreasing sperm count and motility)
- Smoking, passive smoking, vaping
- Excessive alcohol consumption
- Recreational and psychoactive drug use (including cocaine, marijuana, androgenic anabolic steroids)
- Poor sleep, sleep duration, altered circadian rhythms (e.g. shift work)
- Sedentary behaviour, or excessive exercise (esp. cycling due to pressure on scrotum)
- Restrictive, imbalanced or diets

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Pharmaceutical & medical interventions

- Prescribed and OTC medications (e.g. anti-depressants, cholesterol meds, PPIs vaccines, immunosuppressants, some antibiotics, NSAIDs, steroids)
- Mandated medical interventions (e.g. C-19 mRNA)
- Radiation, chemotherapy, radioactive contrast dyes
- Long-term use of pharmaceutical contraception
- A history of elective termination/s may make it difficult to conceive
- Repeated failed attempts at IVF (e.g. synthetic hormones)

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Toxins in the air & environment

- Environmental pollutants (particulate matter, heavy metals, chemical sprays e.g. ammonia, pesticides) from:
  - industry
  - farming
  - mining
- City living (road transport, domestic fuel burning) – London ranked 18th most polluted city in the world in 2022
- Cloud seeding, solar geo-engineering, weather modification
- Noise pollution (e.g. wind turbines, traffic, city living, etc.)

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Contaminants in drinking water

- Fluoride & anti-corrosive chemicals added to drinking water
- Pharmaceuticals excreted and not removed from the water supply (including birth control, antidepressants)
- PFAS, ‘Forever chemicals’
- Toxic run-off from farming (e.g. nitrates, pesticides), mining and industry
- Desalinated water for drinking (e.g. River Thames)
- Recycled waste-water for drinking (‘toilet to tap’; IPR ‘indirect potable reuse’ systems)

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Toxic chemicals in agriculture & farming

- Pervasive synthetic herbicides, pesticides, fertilisers and biosolids in the soil and on crops
- Glyphosate herbicide (Roundup now reformulated with diquat, fluazifop and triclopyr)
- GMO seeds require chemical farming methods, and pollute non-GMO crops
- DDT – banned in UK in 1984, persists in the food chain
- Synthetic RNA in agriculture
- Depletion of minerals and soil nutrients through over-farming, etc. leads to more synthetic chemicals being used

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Toxic chemicals in livestock food production

- Bovaer – and other methane-reduction additives in feed
- Synthetic hormones (injected and via feed)
- Decades-long overuse of antibiotics, especially in CAFO animals
- Untested mRNA technologies mandated in pork, beef, game, poultry
- Industrial pollutants, biosolids contaminate feed, including pastures
- Toxins in commercial egg production (PFAS, dioxin, PCBs, fipronil)
- Toxins in aquaculture – marine and fresh water (fish, shellfish, algae farming) including antibiotics, disinfectants, pesticides, and hormones

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Toxins in food processing, storage & preparation

- GMOs – not labelled
- Ultra-Highly Processed foods
- Food additives used to improve shelf life, maintain colour, texture and taste (e.g. artificial colours, preservatives, antioxidants, acidity regulators, thickeners, stabilisers, emulsifiers, acidity regulators, artificial flavours, synthetic sweeteners)
- Synthetic / fake food, lab-grown foods, insect protein
- Long distance transportation and long storage of fresh food depletes nutrient value
- Chemicals used in storage of food, packaging (e.g. plastics – BPAs, PFAS, EDCs)
- Microwaving food, especially in plastic containers
- Food coating technology (e.g. Apeel) to ‘prevent waste’ / increase profit (reduces consumer understanding of freshness, etc.)

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Toxic EMF ‘pollution’ & 5G exposure

- Mobile phones, wearable technology, implantable devices
- Wi-fi and cell tower exposure
- SMART homes, SMART meters
- LEDs, artificial lighting, excessive blue light exposure (e.g. computer, mobile, TV screens)
- Radiation and overheating testicles (e.g. laptops / tablets / phones on lap)
- Carrying cell phones / devices on the body (e.g. pants / shirt pockets, bra)

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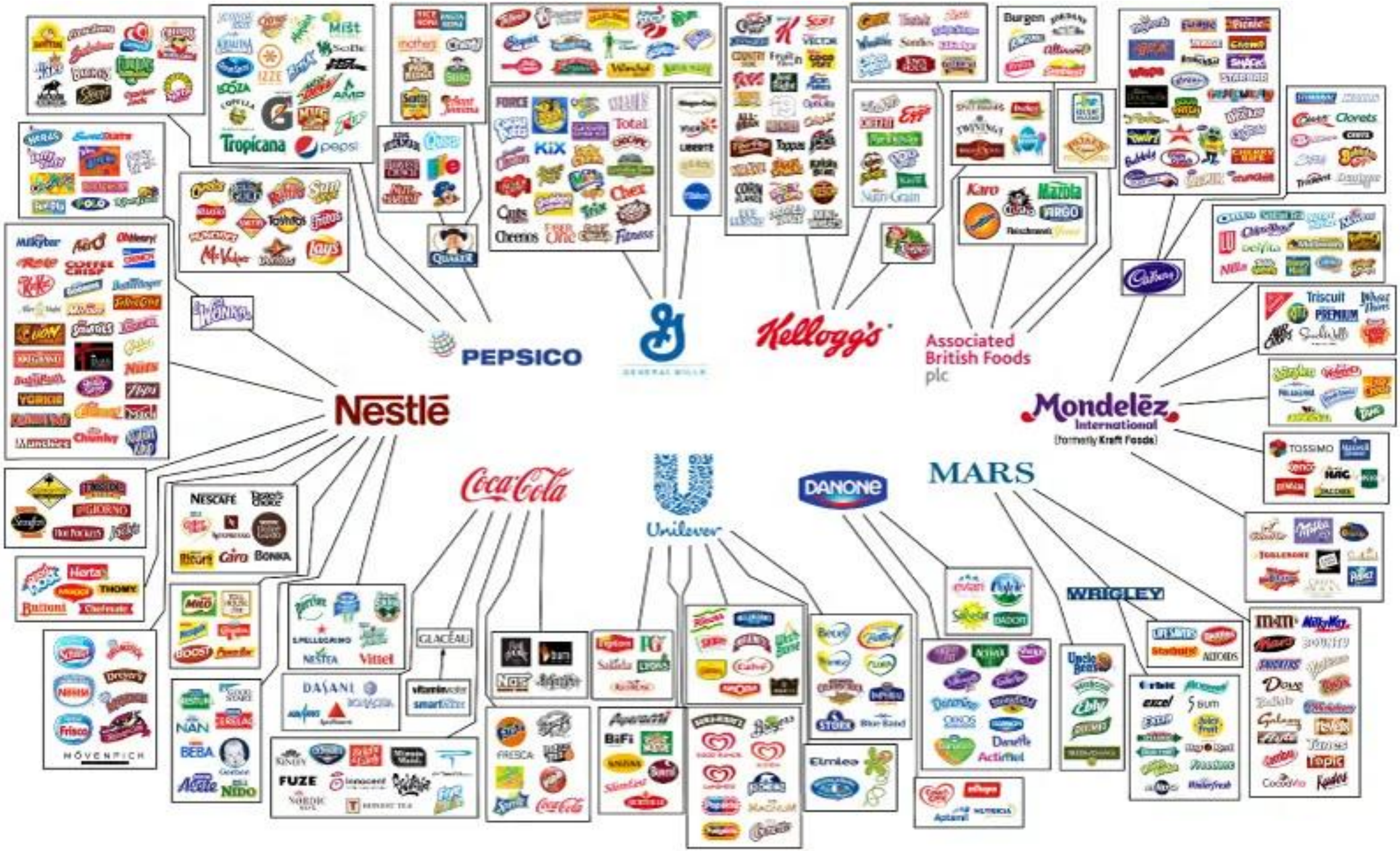
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