



COMMUNITY MEDICINE

Notes

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Vital indices المؤشرات الحيويه

التلخيص شامل السلايدات وكلام الدكتور ه

٨-٨

Vital indices are quantitative measures that describe various aspects of health status of a defined community & summarize the vital events in the human life

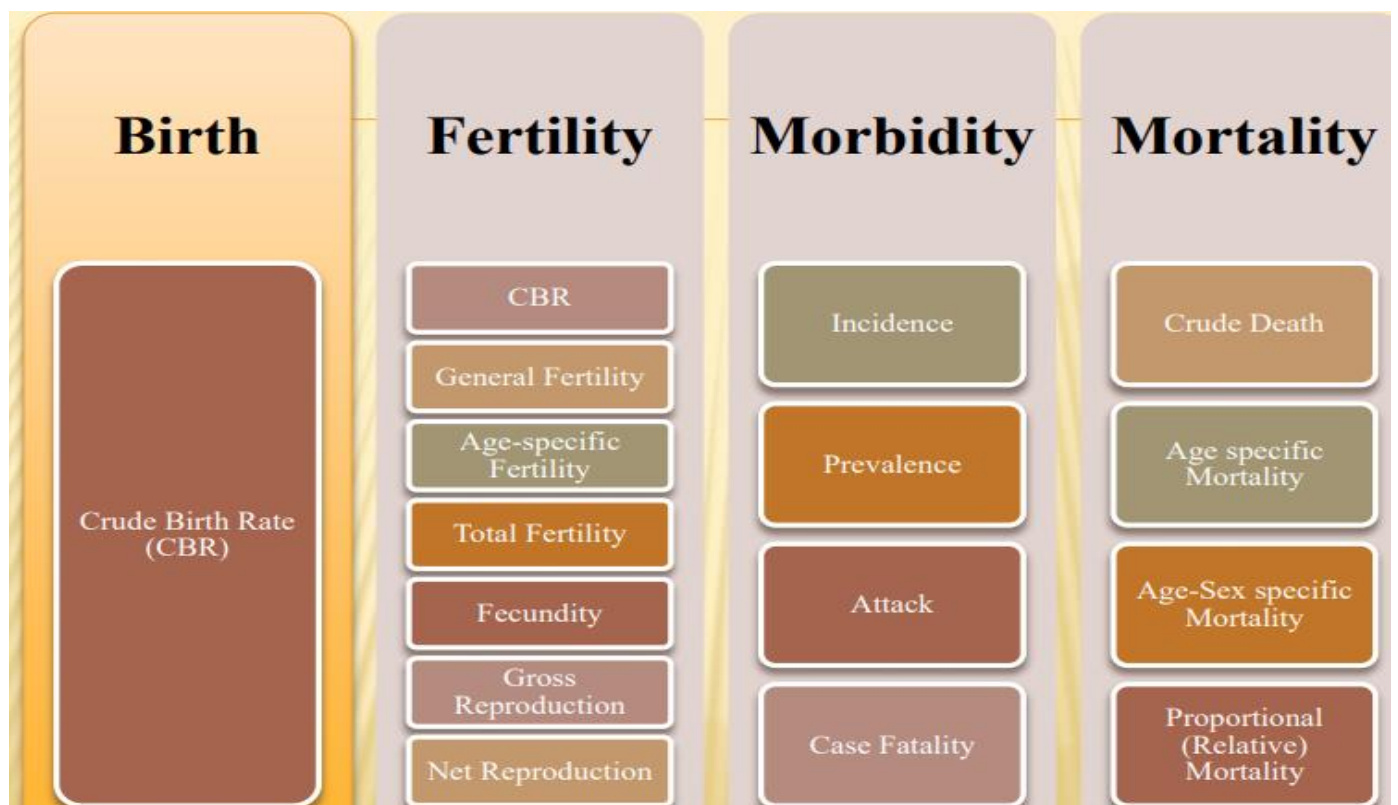
Vital indices are called “vital” because they basically sum-up all the essential stages a person experiences throughout his life

They are also defined as “quantitative” measures as all of them include numbers used to measure birth rate, death rate, crude rate etc

Vital indices include measurements of:

Birth, marriage, fertility, diseases & death

As you can see in the schedule below, crude birth rates are used for measurement of birth rate. However there are several subtypes of crude birth rates as seen in the schedule below, some are associated with fertility, mortality etc



Fertility rate = معدلات الانجاب morbidity rate = معدلات المرض

Mortality rate = معدلات الوفيات

The term “crude birth rate” is a generic term, we have to specify the country in which the study will take place in as well as the year & total population in the region along with precisely mentioning amount of births/total population during the year before we begin our calculations

يعني معادله ال crude birth rate هي معادله عامه قبل لا استخدمها لازم احدد ع اي دوله رح اعمل الدراسات و احدد السنه و عدد المولودين خلال السنه و ال total population

$$\text{Crude Birth Rate (CBR) (births/1000 people)} = \frac{\text{total number of births}}{\text{total population}} \times 1000$$

Recall that we can calculate the total population by the standard method via mid year population calculation

مثلا لو الدراره بسنه 2017 بنحسب ال total population من خلال انه نحسب ال mid year population و اللي هو عدد السكان بشهر 7 لسنه 2017

فيعني عشان يحسبو ال crude rate رح يجمعو معلومات ال total population number من ال mid year population count و ال number of births رح يجيبوه من ملفات بالمركز الصحي مسؤوله عن الموضوع

So after finding the number of births & total population we divide them and multiply by 1000

In 2020, crude birth rate for Jordan was 21.11 births per thousand population.

Crude birth rate of Jordan fell gradually from 50.02 births per thousand population in 1971 to 21.11 births per thousand population in 2020

Examples:

In state residents year 2006 the live births were 180,000 and total population was 12,300,000

We will divide live births 180,000 by total population number 12,300,000 and multiply by 1000 = so result of crude birth rate is 14.6 live births per 1,000 state residents

Its important to know how to calculate rates as there will be multiple questions on the exam about different types of rates

Although CBR(crude birth rate) describes the increase in population over time, yet it is not specific for comparison between countries because the denominator is the whole population.

يعني ال crude rate ممكن استخدمه لحساب عدد السكان بس ما بقدر استخدمه عشان اقرن الفرق بعدد السكان بين دولتين

The rate must exclude young girls, unmarried and menopausal women who are infertile.

المقصود فيها انه عشان اقدر اقرن بين دولتين لازم المعادله ما تكون شي عام لازم يكون في unmarried او menopausal women ال المعادله تستثني ال women يعني لازم تحدد فئه معينه من المجتمع عشان اقدر استخدمها للمقارنه بين الدول

Yet, crude birth rate is used for its simplicity, easy to know birth number because of legal registration in health office & population number at any time (from census and inter censuses methods). (10 minutes)

يعني ال crude birth rate بنستخدمه بكثره لانه بسيط جدا وبسهل الامور بس ما بنعتبره دقيق لانه ما بصنف السكان حسب مثلا ال fertility او ال age group لا بجمع كل السكان

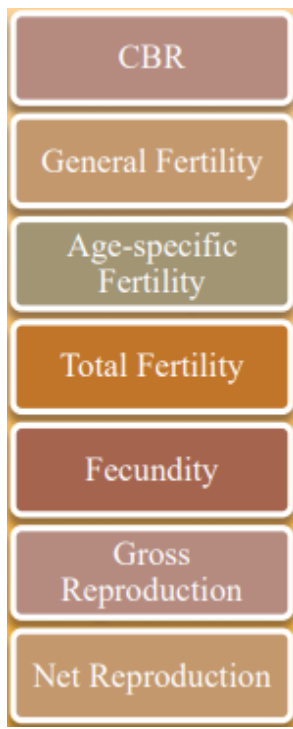
FERTILITY INDICES معدل الخصوبه

Fertility definition:

The reproduction performance of a population معدل خصوبه المجتمع

Types of fertility rates:

(we will discuss them in details throughout the lecture)



We mentioned that there are different types of fertility rates, we talked about first type which is CBR (crude birth rate)

1) First type of fertility rate: Crude birth rate(CBR)

we previously talked about it

2) Second type of fertility rate: General fertility rate (GFR)

GFR=

No. of live births X1000

No. of women (15- 49ys) in the same locality & year.

لاحظوا انه ال crude fertility rate ييعتبر مش specific ويشمل كل ال population مش محدد اشي معين بينما ال GFR حدد نوع معين من ال population او لا اختار ال females

ثانيا حدد فئه عمريه الي هي 15-49 years والتي بنعتبرها childbearing age و هاي الفئه اللي بتهمنا بال GFR لانو بهاد ال rate بدنا نحسب معدل خصوبه المجتمع فبس اللي بهمنا الفئه القادره عالانجاب

Since women in the reproductive age constitutes about 25% (1/4) of the population, therefore the GFR is considered to be about 4 times the CBR

تفسير الجملة اللي بالخط الاحمر:

ممكنا نحسب ال GFR من خلال انه نطلع ال CBR بعدين نضرب الناتج ب 4 و هيك بيطلع معنا ال GFR بطريقه غير مباشره

طيب كيف صار انه ال GFR يساوي 4 اضعاف ال CBR؟

حكينا ال GFR بيضم كل ال females of childbearing age والتي عددهم يساوي $\frac{1}{4}$ عدد المجتمع كله.. وبالتالي لما نضرب معادله ال CBR ب $\frac{1}{4}$ ال 4 رح نطلعها من المقام للبس.. و هيك بصير كأنو ضربنا ال CBR ب 4 فعشان هيك اختصرنا الموضوع ب انه ال GFR بيساوي 4 اضعاف ال CBR.. اقسام بالله مش عارفه كيف اشرحها اكثر نفسي يكون في خيار voice message بالتلخيص عشان اوصل الفكره احسن:)

GENERAL FERTILITY RATE ADVANTAGES & DISADVANTAGES:

ADVANTAGES	DISADVANTAGES
<p>GFR is a more accurate index than CBR because:</p> <ul style="list-style-type: none"> • It is related only to females in the reproductive age. • It is more suitable for comparison between countries since it eliminates the difference in sex composition. <p>لانه الGFR بيحدد جنس وعمر معين من السكان اللي هم females و childbearing age وبالتالي فيه دقه اكثر من الCBR.. الCBR يكون عام فما نقدر نستخدمه للمقارنه بين الدول بينما الGFR ممكن نستخدمه لان فيه دقه اكثر بالوصف وهالشى مطلوب عشان نتج المقارنه</p>	<ul style="list-style-type: none"> • It doesn't consider that not all females in the reproductive age are married & fertile. يعني الدراسه بتعتمد على النساء اللي اعمارهم بين 15 ل49 بس مافي مراعاة لنقطه انه ممكن يكون في نساء بهاد العمر ما عندهم قدره عالحمل والانجاب • It doesn't consider the difference in females' age distribution in different countries الGFR ما بحط بعين الاعتبار فرق المستوى بالانجاب بين الاعمار المختلفه... يعني مثلا اكيد ال fertility rate لو حده عمرها 25 مش زي اللي عند وحده عمرها 49

3) Third type of fertility rate is AGE-SPECIFIC FERTILITY RATE (ASFR)

It is calculated for every 5 years of the reproductive age of a woman. It is important for differentiating between fertility behaviors at different age groups.

ASFR (age-specific fertility rate) =

$$\frac{\text{No. of live births born to mothers aged (15-19 years)}}{\text{No. of women of the same same group (15-19 years) in certain locality and year}} \times 1000$$

*المعادله كان فيها غلط بالسلايدات بس صححته الدكتور

Therefore there are "7" ASFRs (every 5 years) for all women in the reproductive period.

الفكره من ال ASFR انها بتساعدنا نعمل مقارنات بين الدول والمقارنات بتكون بال fertility rate بين فئات العمريه المختلفه للنساء

وبكون من خلال انه نحسب قدره الانجاب والخصوبه كل 5 سنين عند النساء خلال فتره
ال childbearing (productive) age من عمر 15 ل49 .. وبالتالي لما نحسب الrate
كل 5 سنين معناته رح يكون عندنا **7 different age groups**

We have 7 age groups from 15 to 49 years old

1st age group: 15 to 19 years old

2nd age group: 20 to 24 years old

3rd age group: 25 to 29 years old

4th age group: 30 to 34 years old

5th age group: 35 to 39 years old

6th age group: 40 to 44 years old

7th age group: 45 to 49 years old

When we use the ASFR equation to calculate fertility rates of a certain age group the age group selected in the nominator has to be the same age group of the denominator

يعني اذا اخترنا فئة عمرية مثلا من 15-19 سنه وبدنا نحسب ونقارنها مع دوله ثانيه لازم
نختار نفس الفئة العمرية من 15 ل19

It is a better index than the GFR as it takes into account the difference in age distribution of females in different areas & the degree of fertility in each age group

يعني الASFR أكثر دقه واضمن من الgeneral fertility rate لأنه بحدد فئة عمرية معينه
وهالشي بطلع نتائج احسن وادق

4) Fourth type of fertility rate is Total Fertility Rate (TFR):

Total fertility rate (TFR):

It is the average number of live children that would be born to a woman if she passes through her childbearing period following the ASFR in a given year & locality.

It equals the average of the 7 ASFRs.

يعني ال TFR هو نفسه ال ASFR بس انه بكون مجموع لل 7 age groups وهدفه نعرف المرأه كم ممكن طفل تنجب خلال مرورها بسنين ال childbearing age من 15 ل 49

Total fertility rate -TFR- in 2018:

In Jordan → 2.78 births per woman/children

In Egypt → 3.33 births per woman/children

In 2018 studies in Jordan stated that women can give 2.78% of live births throughout their life while Egyptian women can give birth to 3.33%

EQUATION OF TFR:

$$TFR = 5 \sum ASFR \text{ (for 5-year age for 7 groups)}$$

$$TFR \text{ in } 2016 = 5 (SFR_{15-19ys} + SFR_{20-24} + SFR_{25-29} + SFR_{30-34} + SFR_{35-39} + SFR_{40-44} + SFR_{45-49})$$

الموضوع بكل بساطه انه رح نجمع كل ال 7 age groups مع بعض بعدين نضرب ب5
ليش نضرب ب5؟

لان فرق العمر بين كل age group هو 5 سنين
شرح ثاني سطر بالبوكس اللي فوق:

السطر الثاني هو عبارته عن شرح تفصيلي للمعادله

كتبت فوق عن ال age groups ال7 وحددت كل واحد فيهم و نفس ما انتو شايفين في فرق
5 سنين بين كل age group وبالTFR رح نجمعهم مع بعض ونضرب ب5..

TFR helps in knowing how many children can each woman give birth to throughout the year

A student question: What is the difference between GFR & TFR?

In general fertility rate, the numerator doesn't specify an age group and includes all live births, while in total fertility rate, there is a specific age group

5) Fifth type of fertility rate is FECUNDITY RATE (FR)

FECUNDITY RATE (FR)

Fecundity = يعني متزوجه

Fecundity rate measures the rate of fertility in married women

$$\text{FR} = \frac{\text{No. of live births}}{\text{Married women in a certain locality \& year.}} \times 1000$$

Not all women in childbearing age are married, so fecundity rate is used to measure fertility rate for married women in childbearing age

FR (Fecundity rate) is a better index than the **GFR (general fertility rate)**

Fecundity rate specifies married women while GFR detects number of live births & women of childbearing age, but it doesn't include detailed information concerning married women

يعني الـ GFR يخص النساء اللاتي بسن الـ childbearing age بس ما بحط بعين الاعتبار انه ممكن بعضهم بهاد العمر ما يكونو متزوجين بس الـ fecundity rate بنحسب للمتزوجات وبعمر الانجاب الـ childbearing age

6) Sixth type of fertility rate is gross reproduction rate (GRR)

GRR =

$$\frac{\text{Only born females, (expected to be future mothers)} \times 1000}{\text{Women in the childbearing period.}}$$

= TFR X Proportion of females in relation to the total births.

In Gross reproduction rate (GRR) we divide live births of females by women in childbearing period

يعني هون مرح ناخذ كل الـ live births of males and females زي المعادلات اللي قبل لا بس رح ناخذ الـ live births of females فقط وبنقسمه على women in childbearing period

وهاد هدفه يخلينا نحسب كل ام كم بنت بتقدر انها تتجب بفترة الـ childbearing age

In the second line of the box above, what does it mean when we say GRR = TFR X Proportion of females in relation to the total births?

معناته في طريقه ثانيه ممكن نحسب فيها الـ GRR غير المعادله المباشره وهي من خلال انه نضرب الـ TFR بالـ proportion of females in relation to total births اللي هي نسبة عدد الاناث المولودين من جميع الأطفال حديثي الولاده

الـ TFR هو عدد كل الأطفال اللي ممكن تولدهم الـ female خلال فترة الـ childbearing

وبالتالي لو ضربنا عدد كل الأطفال اللي ممكن تولدهم المرأة مع proportion of

females related to total births نطلع الـ GRR

ممكن تكون نسبة الـ proportion of females to all births هي نص فهيك بنضرب $\frac{1}{2}$

بـ TFR وبتطلع الـ GRR

In Jordan, GRR is estimated to be (1.57), which means that every woman will give birth to 1 to 2 women during her childbearing period (2016)

However, a disadvantage of GRR is that it counts all women and does not consider the possibility of deaths of women during their child bearing period

7) Seventh type of fertility rate (last type) is NET REPRODUCTION RATE (NRR)

NRR:

It takes into consideration the deaths of women during their childbearing period using life tables of females.

الـ NRR بحط بعين الاعتبار انه ممكن يصير في وفاه للنساء بل childbearing age فرح يستثنيهن من المعادله وهيك بصير ادق

$NRR = GRR \times \text{Life expectancy of females during childbearing period from life tables.}$

NRR is the best measure of fertility. This is an exam question.

FACTORS AFFECTING FERTILITY:

Age & sex structure of population	The greater the number of women in childbearing period in a certain population the higher fertility level will be
Age of marriage	The younger the age of marriage the higher is the fertility. لو وحده تزوجت بعمر 18 يكون ال fertility period لها أطول من وحده تزوجت بعمر 37
Socioeconomic conditions	Higher economic status & higher level of education of women are associated with low fertility rates. الدول المتحضرة يكونو متقفين اكثر وبعرفو اكثر عن خطوره كثره الانجاب وعدم الالتزام ب birth control plan فعشان هيك الانجاب عندهم اقل بينما الدول الفقيره ما يكون عندهم وعي وكثير منهم بستغلو ولادهم وبخلوهم يشتغلو بعمر صغير عشان يوفرو لاهلهم مصروف وحتى ممكن ما يخلوهم يكملو تعليمهم يعني بصيرو اداه للتجاره
Fecundity	Physiological capability of couples to reproduce is affected by their health conditions Married couples who are healthy have higher possibility of reproduction than unhealthy couples
Fertility motives	Reasons that motivate a couple to increase or decrease number of children they will have يكون في أسباب تشجع المتزوجين عالانجاب رح نشرح اكثر عنها بجدول ثاني

High fertility Motives	Low fertility motives
<p>A) Economic motives: Children as a source of income to the family. بعض الأهالي يستخدمو ولادهم كمصدر للدخل و بخلوهم يشتغلو بعمر صغير وهالشى بحفز هالنوع من العوائل انهم ينجبو أطفال اكثر عشان يكون في دخل اكثر</p> <p>B) Health motives: High infant & preschool death rates. اكتشفو انه الدول اللي بكون فيها معدل وفيات الأطفال عالي بشجع الاهل انهم ينجبو أطفال اكثر نفس مثلا حاله اهل فلسطين بكون بالعيله تقريبا 15 شخص Palestinians know the death rate of children is high which motivates them to bring more children into their life in order to have more people defend and fight for their country):</p> <p>C) Cultural & religious motives: - Traditions & community “large family is considered as a source of power & social status”. - Some wives “large number of children ensure security& prevent divorce”. بعض النسوان بفكرو انه اذا انجبو أطفال اكثر رح يربطو زوجهم فيهم اكثر وهيك بتضمن انها بخط الأمان فهالشى بحفزها تنجب اكثرحتى لو عارفه انها مرح تقدر تعنتي فيهم اهم شي المحروس ما يزعل ويسحب عليها): - Family planning is prohibited in Islam. في ناس عندهم معتقد انه ال family planning حرام لانه بفكرو انو الهدف منه منع الانجاب بس فعليا الهدف منه تنظيم الانجاب مو منعه ولان هاي الفئه ما بتمشي ع نظام family planning بكون عندهم high fertility motives</p>	<p>A) Economic motives: Large expenses for good education & health. Some families believe they’re economically incapable of financially supporting a lot of children so they give birth to 1 or 2 so they can make them live a happy, healthy and well educated life</p> <p>B) Health motives 1) Mother & Children Health are better with suitable spacing of pregnancies. كل ما كانت صحة الام احسن رح تكون صحة الطفل احسن فبعض الأمهات يفضلو انهم يجيبو طفلين او 3 بس عشان يحافظو على صحتهم وصحة ولادهم</p> <p>2) Large family: *Bad effect on physical, mental, social & spiritual health of the family. اذا كان عدد افراد العيله كبير الام مرح تلحق انها تنتبه لكل فالاطفال بكون عندهم نقص عاطفي وبياتر ع نفسيتهم و ممكن ما يصلحهم التعليم والمدارس وهالشى باثر عال social and mental health *Hazards of deprivation, child abuse, delinquency</p>

كثرة الأطفال ممكن تسبب سوء تغذية للطفل بسبب
الفقر او ممكن يسبب بانحراف الأطفال أخلاقيا
بسبب عدم الاهتمام الكافي وممكن لو كلهم عايشين
بغرفه وحده تزيد المشاكل وال child abuse

MORBIDITY INDICES:

Morbidity rates معدل حدوث الامراض :

They are disease occurrence data that are used in disease surveillance.
The most widely used measures of illness in a population are incidence
& prevalence rates

Types of morbidity rates:


- 1) Incidence rate معدل الحالات الجديده
 - 2) Prevalence rate معدل الحالات الجديده والقديمه
 - 3) Attack rate
 - 4) Case fatality rate
-

A) INCIDENCE RATE حالات المرض الجديده

Incidence rate = $\frac{\text{Number of new cases over a time period}}{\text{Total population at risk during the same time period}} \times \text{multiplier (e.g., 100,000)}$

Number of new cases = 1,085
Population at risk = 37,105

Incidence rate = $\frac{1,085}{37,105} = 0.02924/8 = 0.003655 \times 100,000$
= 365.5 cases per 100,000 women per year



Incidence rate is associated with follow-ups and new cases
The population at risk can be the entire population in a specified area, or specific group of people “people of certain age, sex etc”

يعني ال incidence rate له علاقه بالحالات الجديده للناس اللي ب group of risk يعني
مثلا لو في مجموعه ناس مخالطين لمريض كورونا هتدول بنسبيهم group of risk وبتعمللهم
follow up ونضل نتابعهم ونشوف اذا في حالات جديده ولا لا ... وهاد اسمه incidence
rate اللي هو معدل الحالات الجديده للناس من ال group of risk

Importance of incidence rate:

1) It is very important parameter in epidemiology

في قسم بالصحه العامه اسمه قسم الوبائيات وال incidence rate مهم جدا لهذا القسم من
الصحه

2) It tells us about new cases & thus we can associate this event
of illness with the possible causal factors.

Incidence rates are associated with follow-up studies, these studies allow us to build a cause-effect relationship. How can we build that relationship?

لما نعرف سبب او العوامل اللي بتأدي لمرض هالشبي بساعدنا نعرف أسباب المرض والشغلات اللي بتساهم انه يصير وممكن نعرف الشغلات هاي من خلال حساب incidence rate ال

مثلا ممكن اجيب 10 اشخاص يدخنون واشوف شنو اثر التدخين عليهم من ناحيه انه مسرطن او لا وبعد مثلا 10 سنين ارجع اشوف نفس ال 10 اشخاص هذولي واشوف اذا واحد منهم صار معاه كanser ولا لا وكل حاله كanser جديده نحسبها من خلال incidence rate ال

So the “cause” here is smoking and the “effect” of the cause is “cancer”

And that’s how we can build a cause-effect relationship using incidence rate

3) It can be calculated for both chronic & acute diseases

In incidence rate we can study acute & chronic diseases while in prevalence rate we cant include acute diseases in our studies & investigations as it focuses on chronic cases only

يعني لو صار معي مرض acute بكون تعالجت وتعافيت منه بسرعه فمارح يدخل ضمن prevalence rate study ال

4) It measures the relative importance of one illness over the other.

Ya3ni for example if influenza incidence rate this year was 10% and corona was 25% this shows that incidence rate of corona is more important than influenza as it spread more in the community.. and that’s how incidence rate helps us measure relative importance of one illness over another

B) PREVALANCE RATE

نستخدمه عشان نقيس مدى انتشار مرض معين في المجتمع يعني ع سبيل المثال لو ابي اقيس معدل انتشار ال hypertension بين طلاب سنه رابعه رح اقولهم يجتمعون بقاعه مثلا بيوم الثلاثا من الساعه 8 الصبح ل3 العصر عشان اسوي examination بنفس الوقت هذا اسمه cross sectional study و لما تطلع النتيجة مثلا بلاقي 40 واحد hypertensive وهو مو عارف .. شلون رح نكتب النتيجة؟

The result will be written like this:

$$\frac{40 \text{ (number of hypertensive students)}}{\text{all students examined}} \times 100$$

وهذا الفرق بين ال prevalence and incidence rate
بال incidence rate بنتابع مجموعه من الناس لفته ونشوف الحالات المرضيه اللي ممكن تصيبهم بسبب بعض ال risk factors بينما ال prevalence rate بنجمع مجموعه من الناس وبنفحصهم وبنشوف لو عندهم مرض ولا لا زي مثلا hypertension

1) POINT PREVALENCE:

$$\frac{\text{Number of current cases of an illness (old \& new) at a point of time}}{\text{Population examined at same point of time}} \times \text{constant}$$

Point prevalence is used for a short period of time

نفس المثال اللي ذكرته فوق عن ال hypertension كانو يقسيو ضغط الطلاب في فتره زمنيّه محدده من 8 الصبح ل3 العصر بنفس اليوم بتطلع النتيجة فهاد اسمه point prevalence بكون لفته قصيره

2) PERIOD PREVALENCE:

$$\frac{\text{number of current cases of an illness (old \& new) over a period of time}}{\text{midyear population of the same period}} \times \text{constant}$$

Period prevalence takes months to years of study so it takes longer time than **point prevalence**

For example when we're taking prevalence rate of a large community as the case is in national studies it may take months to finish unlike the case of point prevalence where the prevalence rate will be recorded in a very short time

ال period and point prevalence ال لهم نفس المعادله بالزبط بس في حال كنا بنعمل دراسه على عدد كبير من الناس لفته طويله ف بمعادله ال point prevalence رح نستخدم mid year population كمقام للمعادله بس لو كانت الدراسات فترات طويله بس عدد الناس اللي رح نسوي عليهم الدراسه اقل رح يكون المقام لمعادله ال period prevalence نفس مقام معادله ال point prevalence وهي اللي هو population examined at point of time

$$\text{Point prevalence rate} = \frac{\text{Number of existing cases of the disease}}{\text{Total study population}} \text{ At a point in time} \times 1,000$$

$$\text{Period prevalence rate} = \frac{\text{Number of existing cases of the disease}}{\text{Average study population}} \text{ Within a time period} \times 1,000$$

IMPORTANCE OF PREVALNCE RATE:

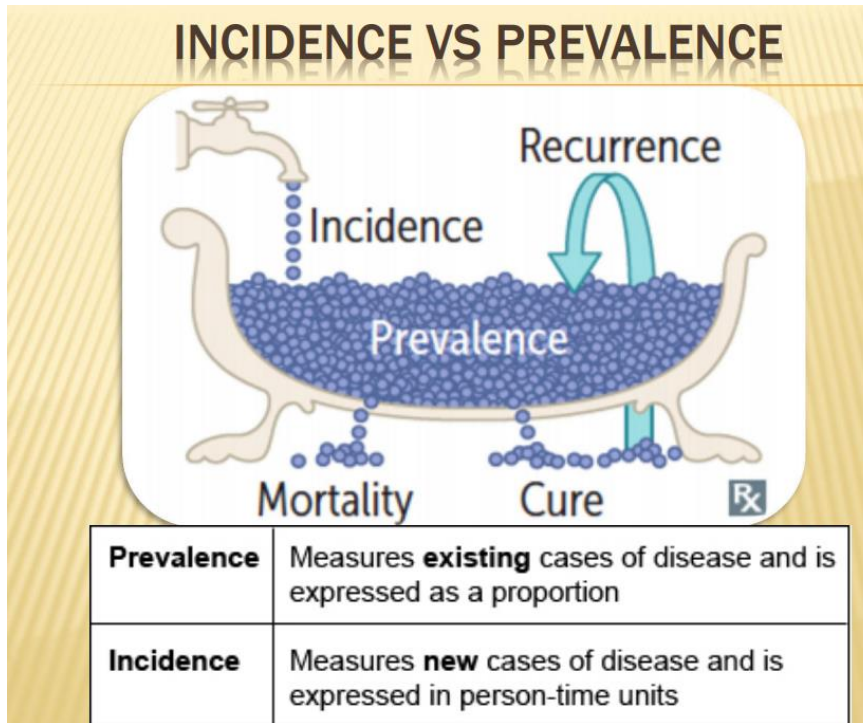
- It is an indicator of the burden of a disease on a population since it reflects the number of cases whether old or new.

Prevalence rate shows the number of cases of a disease (like cancer) that's spreading widely in the community and requires a lot of effort and money to treat it which makes the disease a burden on the population and prevalence rate is used to stress on the burden of a disease on the community

- It measures the relative importance of one illness over the other.
(explained previously in incidence rate)

- It can be used for evaluation of health services

The higher the prevalence rate the more it shows the spread of the disease in the population which indicates low quality of health services, but if prevalence rate was low that means less disease which means good health services



Refer to the picture while reading this. The diagram above illustrates the differences between incidence & prevalence

Incidence rate is used for discovering new cases while prevalence is for already existing cases

ولما نجي نعمل اكرامينشين لل community عشان نشوف ال prevalence rate وكنا مثلا بنفحص 20 شخص... اذا 3 منهم ماتو او 4 منهم تعافو مثلا رح نشيلهم من الحسابات.. فيعني بال prevalence rate ما بنحسب ال mortality & cured cases زي ما هو مبين بالصوره فوق

In the picture above, you can see the word “recurrence”, what does mean?

Basically, we said that mortality & cured cases are excluded from prevalence rate results, however in some cases of cured patients recurrence of disease may occur and in that case we will return the “cured patient with recurrence” to our prevalence calculations

Look at the definition of incidence in the box above, what do we mean by “incidence is expressed in person -time units”?

يعني عدد الحالات 100 حاله بالسنه.. يعني بقيس عدد الحالات مقارنة بالوقت.. مثلا 10 حالات بالشهر.. الخ 100 حاله بالسنه.. الخ

CASE:

If we examine a community of 200 people and we followed up with the population for a whole year when the final results come we find out that 10 people died from the community, 5 people have been cured and 10 people were cured and the had recurrence of the disease, calculate the prevalence and incidence rate

عشان نحسب ال prevalence لازم تطرح من ال 200 عدد الوفيات وعدد الناس اللي تعافت

When calculating prevalence:

5 people cured, 10 people died, so total number of people we will include in our calculations is 185

When calculating incidence rate:

Take into account the new cases only

ANOTHER EXAMPLE:

Suppose we were interested in the problem of diabetes in a nursing home with 800 residents.

We would begin by doing blood tests on all residents to determine which were diabetic.

If 50 of the residents were diabetic initially, then the prevalence of diabetes at this point in time would be $50/800 = 0.0625$.

يعني لما اجي ابي افحص ال 800 شخص اول مره ولقيت 50 منهم أصلا معهم سكري معناته معهم سكري من زمان مو شي جديد فهذا نعتبره من ال prevalence rate مو incidence rate لانه أصلا موجود من زمان .. بعد ما حسبنا الرقم طلع معاي الناتج 0.0625 لازم اضربه بثابت نفس مثلا 1000 عشان يعطيني رقم صحيح فبطلع لي 62.5

The standard way of expressing this would be to say that the prevalence was 62.5 per 1000 residents or 6.25 per 100 residents, or 0.0625%

If we want to estimate the incidence rate of diabetes in this population over the next 12 months, we need to exclude the 50 people who are already diabetic and focus on the 750 residents who are disease-free initially.

We would then need to do additional blood tests to determine how many new cases developed during the span of time.

Because some of the residents might die or be transferred to other facilities during the year, we ideally would like to take blood tests frequently, but for financial and logistical reasons, we might simply conduct a second series of blood tests after one year.

ال blood test مفروض يكون بشكل مستمر يعني شهريا بس عشان الإمكانيات الماديه بنعمله مره بالسنة

If 25 were found to be diabetic at the end of a year, then the incidence would be $25/750 = 0.0333$ or about 3.3 per hundred (3.3%) over a year.

لازم بعد ما يطلع معك الناتج تضربه بثابت عشان يعطيك رقم صحيح.. ولاحظو هون المقام هو 750 مش 800 عشان احنا شلنا ال 50 مريض اللي كانوا أصلا معهم سكري قبل لا نبليش ال follow up

Note that we are describing the time span, i.e. the period of observation, when we report the incidence.

انتبهو لشغله ثانيه.. بال incidence rate لما طلع الناتج كتبنا 3.3% over a year بس بال prevalence كتبنا 62 وهذا لانه ال incidence rate بنحسب in person-time unit بس ال prevalence ب proportions

C) ATTACK RATE:

It is an incidence rate estimated in an epidemic (or outbreaks) when observation of population at risk is for short period

هو نفسه ال incidence rate بس الفرق انه بنحسبه لما نكون بفترة epidemic or outbreak نفس فتره الكورونا

يعني لو الدكتور جابت case بالامتحان وذكرت disease outbreak فيها معناه رح نسحب باستخدام attack rate

Attack rate =

$$\frac{\text{No. of new cases of specific disease during an epidemic}}{\text{Total no. of persons at risk during the same time.}} \times 100$$

D) CASE FATALITY RATE:

CFR =

$$\frac{\text{No. of deaths of cases from specific illness}}{\text{No. of cases of the same illness in the same time and place}} \times \text{constant.}$$

مع انه اسمه case fatality بس بنعتبره من ال morbidity rates ليش؟

لانه بحسب عدد الوفيات من مرض معين وهالشى بساعدنا نعرف مدى خطوره مرض معين او ل virulence للمرض.. يعني مثلا اذا كان في 1000 حالة من سرطان الرئه وصار مثلا عدد الوفيات منه 100 هالشى بساعدنا نعرف خطوره سرطان الرئه مقارنة بباقي السرطانات

كل ما كان ال CFR لمرض معين اكبر كل ما كان تصنيف المرض اخطر واعنف

So CFR is not a mortality rate, it's a morbidity rate (exam Q)

It measures the virulence of an agent & the severity of a disease.

Therefore is considered as a morbidity measure although it involves deaths.

ولازم نقيس ع نفس المرض... يعني لو كان البسط اللي هو عدد حالات الوفاه من مثلا الكانسر لازم المقام يكون عن عدد حالات المرضى بنفس نوع الكانسر

MORTALITY RATES:

Although not effective as the morbidity indices but sometimes they are the only available data.

لانه لو عرفنا ال morbidity rate ممكن تساعدنا نخفف من العوامل اللي بتزيد المرض وهيك بنخفف من الحالات والوفيات.. بس ال mortality rates خلص بكونو الناس ماتو فمش نفس فايده اني اعرف ال morbidity rate

- Death rates are important indicators of the health status in a community.
- They can indicate the impact of a particular cause on the population.

يعني مثلا لو كان في كثير وفيات بسبب حوادث السير ممكن نستخدم ال mortality rates كطريقه لتوعيه الناس وتثقيفهم

- They can study the relation of a certain cause to the disease occurrence

Types of mortality rates:

1) Crude death 2) age specific mortality

3) age-sex specific mortality

4) proportional (relative) mortality

1) CRUDE DEATH RATE:

$$\frac{\text{Total No. of Deaths from all causes in 1 year} \times 1000}{\text{No. of persons in the population at mid year}}$$

In 2020, death rate for Jordan was 3.9 per 1,000 people. It fell from 9.9 per 1,000 people in 1971 to 3.9 per 1,000 people in 2020. This improvement can be attributed to: community development, better health services, application of modern techniques, new drugs, and health education etc. CDR is not specific rate

as it includes all deaths in a population irrespective of its age, sex distribution or cause of death

2) AGE SPECIFIC MORTALITY RATE (ASMR)

ASMR =

$$\frac{\text{No. of deaths in a specified age group \& specific time}}{\text{Population of the same age group \& at the same time period}} \times \text{constant}$$

In ASMR we divided the population according to their ages which makes it easier for us to compare the ASMR of Jordan to other countries

لانه بالASMR حددنا فئه عمريه فبكون ادق مو نفس الCrude mortality rate بكون عام ومافي دقه فما اقدر استخدمه للمقارنه

كل مرحله عمريه لها سبب common للوفيات فعشان هيك قسمنا المجتمع لفئات عمريه بلASMR

ASMR describe the rate of deaths in each age group. The causes of deaths among age groups are different and therefore by using this rate we can prioritize these causes to be solved.

In old age more common reasons of age is chronic disease like HT, DM while in younger ages could be stress or trauma

$$\text{Age specific mortality rate} = \frac{\text{Number of deaths of persons age 1-14 in a given year}}{\text{Total persons aged 1-14 in the same period (1 year)}} \times 100,000$$

$$\text{Age specific mortality rate} = \frac{\text{Number of deaths of rural elderly age 55+ in a given year}}{\text{Average population of rural elderly in the same period}} \times 100,000$$

بالمعادله الأولى الفئه العمريه اللي اخترناها هي من 1-14 سنه وبالمعادله الثانيه الفئه العمريه هي من 55 سنه وطالع

3) AGE-SEX SPECIFIC MORTALITY RATE

$$\frac{\text{No. of deaths of males at certain age group}}{\text{No. of males of the same age group in the same area and time}} \times 1000$$

It's the same as – age specific mortality rate- except here we mention the gender

4) CAUSE SPECIFIC MORTALITY RATE

$$\frac{\text{No. of deaths from a specific cause}}{\text{Population at the same time period}} \times \text{constant}$$

An example to clarify this equation:

Jordan's population is 10million, how many people die yearly from cancer? SO cause specific mortality rate helps us know how many people in a population die from a specific disease like CANCER.

Cause specific MR describes the severity of the disease to cause deaths.
Cancer has high cause specific MR

5) PROPORTIONAL (RELATIVE) MORTALITY RATE (PMR)

$$\frac{\text{No. of deaths from a specific cause}}{\text{Total deaths from all causes in the same area \& time}} \times \text{constant}$$

طيب ب شنو يفرق عن اللي قبله؟

death from specific disease ال cause specific mortality rate
بال death ل whole population without death ال proportional
mortality rate ف بحسب عدد الوفيات من مرض معين مقارنه بجميع الوفيات
ال population

PMR describes the relative importance of a specific disease as a cause of mortality in relation to other causes

Goodluck, if you have any questions, don't hesitate!:(