Worked example of the calculation of the price of purchasing medication: Fluoxetine

The annual price of medication to treat a population can be estimated using the formula:

* Number of cases to be treated x Price per unit of medicine x Number of units per day x Duration of treatment in days

**Worked example: the treatment of depression using fluoxetine in Afghanistan**

1. **How to find the: *Number of cases to be treated***

The number of cases to be treated per 1 000 000 population can be estimated from the prevalence, the proportion of cases who appropriate for treatment with medication, and the coverage target.

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| **Question** | **Example using depressive disorder** | **Number per 1 000 000** |
| 1. What is the prevalence of the disorder?
 | The prevalence for depressive disorders in Afghanistan is 3.3% of the adult population aged 15 and over.[[1]](#footnote-1) | 33 000 |
| 1. How many cases need treatment with antidepressant medication?
 | The total prevalence (above) includes the full range of severities, many of which are mild and do not require medication treatment. Approximately, 33% of all cases are at least moderately severe and are appropriate for treatment with medication. | 11 000 |
| 1. What is the coverage target?
 | The coverage target can be adjusted to match local circumstances and resources. Starting from a low baseline (e.g. 5−10%), it may be impractical to aim for a very high (e.g. 80%) coverage target. In this example, 50% coverage is used as a feasible goal. | 5500 |

Thus the number of cases to be treated to achieve 50% coverage is 5500 per 1 000 000 adult population.

1. **How to find the: *Price per unit of medicine***

You may have your own local data on the price of medication, or you could search the database of medicine prices, availability, affordability and price components at <http://www.haiweb.org/MedPriceDatabase/> . When you land on the haiweb page, you will see guidance on how to use the database on the right, and the criteria that you can carry out your “Analysis by” on the right. For example, to find the price of fluoxetine in Afghanistan:

* Expand: “Price and availability by medicine”
* Expand: “By therapeutic group (WHO EML classification)”
* Expand: “24 - Psychotherapeutic medicines”
* Expand: “Fluoxetine”
* Expand: “Fluoxetine 20 mg cap/tab”
* Select: “All reference price sources”
* In the new selection area in the middle of the page, untick: “Select all/Deselect all”
* Scroll down and tick: “Afghanistan November 2011”
* Scroll to the top and select “Show data for selected surveys”
* At the right of the page under “Analysis by” use the drop-down menu to select “US $”.
* In the table, read across from “Lowest price generic”, under “Price”, you will see the unit (tablet) price for fluoxetine 20mgs:  US$ 0.028 (database accessed on 14.05.2017).

Thus the price of a unit of the usual daily dose of fluoxetine 20mgs: US$ 0.028.

1. **How to find the: *Duration of treatment* and *Number of units per day***

Guidelines, such as the mhGAP intervention guide (Version 2.0) can be used as a source for duration of treatment and number of units per day.

For example: “antidepressant medications usually need to be continued for at least 9−12 months after the resolution of symptoms.”[[2]](#footnote-2) Since it usually takes at least 6 weeks for the resolution of symptoms after commencing treatment with fluoxetine, then a course of treatment is likely to last for 12 months. Thus the typical duration of antidepressant treatment is 365 days.

On page 29, the mhGAP IG V2 indicates the dosing for fluoxetine: “Start 10 mg daily for one week then 20 mg daily. If no response in 6 weeks, increase to 40 mg (maximum 80 mg)”. Thus the usual daily dose for someone who responds to fluoxetine is 20 mg daily.

1. **Calculation of annual price of fluoxetine**

For one person with depression to be treated for one year, the price of fluoxetine 20 mgs per day is:

* Price per unit of medicine (US$ 0.028) x Number of units per day (1) x Duration of treatment (365 days) = US$ 10.22

Applying the figures to the formula (above) to calculate the annual price for 50% coverage of a population of 1 000 000 adults:

* Number of cases to be treated (5500) x Price per unit of medicine (US$ 0.028) x Number of units per day (1) x Duration of treatment (365 days) = US$ 56 210.

This calculation can be adapted as guidance for different population sizes and for different levels of coverage.

The adult (aged 15 years and over) population of Afghanistan is 19 650 688 (at the start of 2017). Thus the target number of cases of depression to be treated in Afghanistan each year to achieve 50% coverage is: 5500 x 19.65 = 108 075 people.

* Number of cases to be treated (108 075) x Price per unit of medicine (US$ 0.028) x Number of units per day (1) x Duration of treatment (365 days) = US$ 1 104 527.

If the coverage target is dropped to 30%, then the target number of cases of depression to be treated falls to 64 845 people; and if the coverage is raised to 80%, the target will be 172 920 people.

*For 30% coverage:*

* Number of cases to be treated (64 845) x Price per unit of medicine (US$ 0.028) x Number of units per day (1) x Duration of treatment (365 days) = US$ 662 716.

*For 80% coverage:*

* Number of cases to be treated (172 920) x Price per unit of medicine (US$ 0.028) x Number of units per day (1) x Duration of treatment (365 days) = US$ 1 767 242.

The annual price of fluoxetine for a coverage target of 50% in a province with a population aged 15 and over of 2 456 000 people can be calculated:

The target number of cases of depression to be treated in the province for 50% coverage is 5500 x 2.456 = 13 508 people.

* Number of cases to be treated (13 508) x Price per unit of medicine (US$ 0.028) x Number of units per day (1) x Duration of treatment (365 days) = US$ 138 052.
1. Depression and other common mental disorders: global health estimates. Geneva: World Health Organization; 2017. [↑](#footnote-ref-1)
2. [mhGAP intervention guide for mental, neurological and substance](http://www.who.int/mental_health/mhgap/mhGAP_intervention_guide_02/en/)

[use disorders in non-specialized health settings – version 2.0](http://www.who.int/mental_health/mhgap/mhGAP_intervention_guide_02/en/). Geneva:World Health Organization; 2016 (see page 28). [↑](#footnote-ref-2)