Let’s generate a random data set of 24 subjects.

```
julia> choose_covariates() = (isPM = rand(["yes", "no"]),
                              Wt = rand(55:80))
julia> function generate_population(events,nsubs=24)
         pop = Population(map(i -> Subject(id=i,evs=events,cvs=choose_covariates()),1:nsubs))
         return pop
       end

julia> ev = DosageRegimen(100, ii=24, addl=3)
DosageRegimen(1×8 DataFrame
| Row | time    | cmt   | amt     | evid | ii      | addl  | rate    | ss   |
|     | Float64 | Int64 | Float64 | Int8 | Float64 | Int64 | Float64 | Int8 |
|-----|---------|-------|---------|------|---------|-------|---------|------|
| 1   | 0.0     | 1     | 100.0   | 1    | 24.0    | 3     | 0.0     | 0    |)

julia> ev1 =  generate_population(ev)
Population
  Subjects: 24
  Covariates: isPM, Wt
```

Now we assign values to the parameters

```
Param = (  θ = [1.5,  #Ka
                1.1,  #CL
                20.0,  #V
                eps(), # lags2
                1, #Bioav
                0.5, # isPM CL
                eps() # duration
                ],
           Ω = Diagonal([0.04,0.04]),
           σ_prop = 0.04
         )
```

We run the simulation with a simobs call

```
julia> sim1 = simobs(m_diffeq, ev1, p; abstol=1e-14, reltol=1e-14)
```

We get the subject wise simulation output

```
Subject
  ID: 1
  Events: 4
, 0.0:1.0:96.0, (cp = [4114.33, 4057.56, 4001.57, 3946.35, 3891.9, 3838.2, 3785.24, 3733.0,
3681.5, 3630.7  …  8676.2, 8556.49, 8438.42, 8321.98, 8207.15, 8093.91, 7982.22, 7872.08,
7763.46, 7656.33], dv = [3254.99, 1998.61, 3497.23, 4780.26, 3041.26, 2604.17, 3277.17,
3295.85, 4776.44, 3386.44  …  8335.86, 8939.89, 10491.5, 7646.75, 7337.47, 8872.07, 5317.99,
6404.97, 7250.41, 9919.32]))
```