









$$J(E_1) = \begin{bmatrix} -\mu_H - \beta_{HM} \frac{I'_M}{N_H} & 0 & 0 & 0 & 0 & 0 & -\frac{\beta_{HM} S'_H}{N_H} \\ \beta_{HM} \frac{I'_M}{N_H} & -(\mu_H + \alpha + \gamma) & 0 & 0 & 0 & 0 & \frac{\beta_{HM} S'_H}{N_H} \\ 0 & 0 & -(\mu_H + \delta) & \xi & 0 & 0 & 0 \\ 0 & \alpha & 0 & -(\mu_H + \varepsilon) & 0 & 0 & 0 \\ 0 & 0 & \delta & 0 & -\mu_H & 0 & 0 \\ 0 & -\frac{\beta_{MH} S'_M}{N_H} & 0 & 0 & 0 & -\left(\beta_{MH} \frac{I'_H}{N_H} + \mu_M\right) & 0 \\ 0 & \frac{\beta_{MH} S'_M}{N_H} & 0 & 0 & 0 & \beta_{MH} \frac{I'_H}{N_H} & -\mu_M \end{bmatrix}$$

After solving the characteristic equation all the eigen values of  $|J(E_1) - \lambda I| = 0$  are negative, which shows that the system (4) is stable for the endemic equilibrium point  $E_1$ .

**5. Simulation :** All five fig. draw with help of same parameter. In 1<sup>st</sup> graph we comparing hospitalized and recovered number of patient with using vaccination. In 2<sup>nd</sup> graph 3D presentation of recovered patient no. with hospitalized and infected no. In 3<sup>rd</sup> graph we compare the number of recovered patient with infected no. and time. Form first three graph shows the recovery rate are increase as increase with time. In 4<sup>th</sup> graph shows the comparing between number of susceptible and infected patient with respect to time.

**6. Conclusion :** In this paper SIRHV epidemic infectious disease model for Dengue. This S model control the spreading of the disease in Human population. By using Routh-Hurwitz Criteria we find all the eigen values for endemic point are negative which shows that the above model SIRHV (Susceptible Infectious Recovered Hospitalization Vacation) is stable. Extending our work, we can also use harmonic mean type incidence rate for better stability and control the disease.

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